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ABSTRACT

To help determine the feasibility of establishing in any Connecticut town new regional vocational-technical schools that would not produce any adverse effects on existing schools, this research study presents a methodology and computerized program by which these assessments may be made. Part One discusses the need for this type of methodology and its important characteristics. Part Two describes the concepts and parameters, including summary presentations of relevant statewide data and the procedural approach to determine the impact of a new regional vocational-technical school upon enrollments in existing regional vocational-technical schools. Part Three presents four illustrative case of proposed location areas and their projected impact on existing schools to demonstrate the implementation of the new methodology. Part Four presents detailed consideration of the various factors within the new enrollment projection methodology, their limitations and accuracy, and also considers potential improvements to the methodology through improved data collection and analyses. Summary conclusions and recommendations resultant from this study are discussed in Part Five. (Author/EC)

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RESEARCH STUDY
ON
PLANNING FOR CONNECTICUT REGIONAL
VOCATIONAL-TECHNICAL SCHOOLS

FINAL REPORT

by

University Research Institute of Connecticut, Inc.
1211 Barnes Road
Wallingford, Connecticut 06492

June 1974

URIC Report No. 74-54

CONNECTICUT STATE DEPARTMENT OF EDUCATION
DIVISION OF VOCATIONAL EDUCATION
RESEARCH AND PLANNING UNIT
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Research Study
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Planning for Connecticut Regional Vocational-Technical Schools

Index

	<u>Page</u>
Preface	i
Acknowledgments	i/ii
URIC Research Team	ii
SUMMARY	iii/iv
FINAL REPORT	
PART I - INTRODUCTION	1
Purpose of Project	1
General Comparison of Present and New Projection Methods	2
PART II - DESCRIPTION AND DISCUSSION OF NEW ENROLLMENT PROJECTION METHODOLOGY	6
Feasibility Projections for Proposed Town Location: Feeder Towns	6
Applications from Public Schools	7
Applications by Sex from Public School System	9
Applications from Nonpublic Schools	15
Qualified Applicants to Regional Vocational-Technical Schools	17
Grade Retention Ratios in Regional Vocational-Technical School System	19
Double Projection Series	24
Summary of Projection Parameters	27
Projected Impact on Existing Regional Vocational-Technical Schools	29
Use of Attrition Rates	32

Index (continued)

	<u>Page</u>
PART III - ILLUSTRATIVE CASE STUDIES	34
A. Proposed Location in the Area of the Town of West Haven	34
Findings for West Haven Area Regional Vocational- Technical School	36
Projected Impact Upon Eli Whitney Regional Vocational- Technical School	37
Projected Impact Upon Platt Regional Vocational- Technical School	39
General Conclusions on Location of a Regional Vocational- Technical School in the Area of the Town of West Haven	42
B. Proposed Location in the Area of the Town of East Hampton	43
Findings for East Hampton Area Regional Vocational- Technical School	45
Projected Impact Upon Vinal Regional Vocational-Technical School	46
General Conclusions on Location of a Regional Vocational- Technical School in the Area of the Town of East Hampton	49
C. Proposed Location in the Area of Bristol-Plymouth- Thomaston	50
Findings for Bristol-Plymouth-Thomaston Area Regional Vocational-Technical School	52
Projected Impact Upon E. C. Goodwin Regional Vocational- Technical School	53
Projected Impact Upon W. F. Kaynor Regional Vocational- Technical School	55
Projected Impact Upon Oliver Wolcott Regional Vocational- Technical School	58
General Conclusions on Location of a Regional Vocational- Technical School in the Area of Bristol-Plymouth- Thomaston	61
D. Proposed Location in the Area of Branford-East Haven- North Branford-Guilford	62

Index (continued)

	<u>Page</u>
Findings for Branford-East Haven-North Branford-Guilford Area Regional Vocational-Technical School	64
Projected Impact Upon Eli Whitney Regional Vocational- Technical School	65
General Conclusions on Location of a Regional Vocational- Technical School in the Area of Branford-East Haven- North Branford-Guilford	67
PART IV - GENERAL IMPLICATIONS OF NEW ENROLLMENT PROJECTION METHODOLOGY	68
Factors Affecting Projection Accuracy	68
Location Town Selection	68
Identification of Feeder Towns	69
Source School Enrollment Data	71
Qualified Rates and Retention Ratios	72
Applicants to Regional Vocational-Technical Schools	72
Projection Alternative	73
Interpretation of Projections	73
Impact Analyses	75
General Considerations	75
Unresolved Issues	77
PART V - CONCLUSIONS AND RECOMMENDATIONS	79

Preface

This research study was undertaken in order to provide the Connecticut Department of Education with an improved methodology and computerized program for use in determining the feasibility of establishment of new regional vocational-technical schools in any pre-selected Connecticut Town. In this context the research study was concerned only with the demographic aspects of determining this feasibility, namely, that feasibility is based upon potential satisfactory achievement of enrollment capacity of new schools without adverse affect (i.e. negative impact) upon existing schools. This research study assumes that there will be no changes in the labor market demand for regional vocational-technical graduates, and that there will be no changes in administration or educational aspects of planning and implementing this type of vocational career training with the school system which would invalidate the results of this research study.

Acknowledgments

As the University Research Institute of Connecticut, Inc. (URIC) is an independent consortium of the research interests and capabilities of thirteen Connecticut universities and colleges, this project could not have been achieved without their individual cooperation. The acknowledgment of URIC's "associated institutions" is most appropriate, viz:

UNIVERSITY OF BRIDGEPORT

CENTRAL CONNECTICUT STATE COLLEGE

CONNECTICUT COLLEGE

FAIRFIELD UNIVERSITY

UNIVERSITY OF HARTFORD

UNIVERSITY OF NEW HAVEN

QUINNIPIAC COLLEGE

RENSSELAER POLYTECHNIC INSTITUTE OF CONNECTICUT

SAINT JOSEPH COLLEGE

SOUTHERN CONNECTICUT STATE COLLEGE

Acknowledgments (continued)

TRINITY COLLEGE
WESLEYAN UNIVERSITY
YALE UNIVERSITY

It is also most appropriate to gratefully acknowledge the cooperation and assistance of the State Department of Education, Division of Vocational Education in this research study, specifically, Messrs. Richard C. Wilson and Michael J. Errede in Research and Planning, and Mr. Daniel Keefe of Warren F. Kaynor Regional Vocational-Technical School in Waterbury.

URIC Research Team

Dr. Thomas E. Steahr - Principal Research Demographer
Dr. William H. Groff - Consultant Demographer
Mr. Charles N. Fitts - Computer Specialist
Mr. Norman H. Spear - Research Consultant

SUMMARY

This report comprehends the conception, development, implementation and transference of an enrollment projection methodology for assessment of need for regional vocational-technical schools throughout the State of Connecticut. It represents a significant technological improvement over the assessment procedures used heretofore, and provides the State Department of Education with a (computer program package) tool by which these assessments may be made quickly and accurately.

In Part I of this report the need for and important characteristics of this new methodology are described. Part II describes its concept and parameters, including summary presentation of relevant basic state-wide data and the procedural approach to determine "impact" of a new regional vocational-technical school upon enrollments in existing regional vocational-technical schools. Four specified case studies are presented in Part III to demonstrate implementation of the new methodology, namely: Proposed location (of a regional vocational-technical school) in the Area of the Town of West Haven, with impacts on the Eli Whitney (Hamden) and Platt (Milford) schools, determined to be feasible (in disagreement with a recent study); Proposed Location in the Area of the Town of East Hampton, with impact on the Vinal (Middletown) school, determined to be not feasible (in agreement with a recent study); Proposed Location in the Areas of the Towns of Bristol-Plymouth-Thomaston, with impacts on the Oliver Wolcott (Torrington), Warren F. Kaynor (Waterbury), and E. C. Goodwin (New Britain) schools, determined to be not feasible (in agreement with a recent study); and, Proposed Location in the Area of the Towns of Branford-East Haven-North Branford-Guilford, with impact upon the Eli Whitney school, determined to be feasible.

Part IV presents detailed consideration of the various factors within

Summary (continued)

the new enrollment projection methodology, their limitations and accuracy, and also considers potential improvements to the methodology through improved data collection and analyses. This report section is complementary to the Technical Manual of the computer program package which accompanies this report and which is further supported by appropriate transference of punch data cards and computer print-out displays.

Part V summarizes conclusions and recommendations resultant from this research study. Specifically, it is recommended that the new projection methodology be used and improved. Potential new regional vocational-technical school sites in Western Connecticut (Washington-Roxbury-Woodbury), South Eastern Coastline (Stonington), and Central Connecticut (Hebron-Marlborough) are identified for future feasibility studies. It is recommended that this new tool be used to reassess potential enrollments to existing regional vocational-technical schools to establish expansion needs and priorities; and, it is recommended that a comprehensive planning research study of the regional vocational-technical school system be undertaken to include economic and educational aspects as well as demographic aspects in determining feasibility and priorities for new regional vocational-technical schools in Connecticut.

Research Study
on
Planning for Connecticut Regional Vocational-Technical Schools

PART I - INTRODUCTION

Purpose of Project

Pursuant to an Agreement for Research between the Connecticut State Board of Education and University Research Institute of Connecticut, Inc. (URIC), this project, entitled "Research Study on Planning for Connecticut Regional Vocational-Technical Schools" was initiated on January 7, 1974. The scope of this project was limited to the demographic aspects of regional vocational-technical school planning.

The major objectives of this research effort were to provide the Connecticut State Department of Education with an independently derived methodology and computer program to allow for the development of a comprehensive plan for the Connecticut regional vocational-technical school system. More specifically, the major goals were as follows:

1. To develop and implement a methodology for assessment of need for regional vocational-technical schools throughout the state.
2. To illustrate this methodology with separate research reports on needs of regional vocational-technical facilities in the selected areas of a) West Haven, b) East Hampton, c) the Thomaston-Plymouth-Bristol area, and d) the Branford-East Haven-North Branford-Guilford area.
3. To prepare a research report on this new methodology and transfer its computer implementation program to the

State Department of Education for future use at the
State Data Center.

General Comparison of Present and New Projection Methods

During the past few years there have been a number of feasibility studies relevant to State planning for vocational-technical education in Connecticut. They have focused on the Milford-Stratford area (November 1966), the New London-Groton area (November 1966), the Enfield and Suffield area (December 1968), the area of Groton (December 1968), of Old Saybrook (December 1968), the area of East Hampton (December 1973), the area of the town of West Haven (December 1973), and the area of Bristol-Plymouth-Thomaston (January 1974) as separate Town-oriented feasibility studies to determine potential need for new regional vocational-technical schools. These research studies accomplished the basic groundwork necessary for the refinements incorporated in the new projection methodology presented here. Both the present and new enrollment projection techniques are basically the grade-cohort projection method. After consideration of alternative demographic projection methodologies, it was determined that this grade-cohort method was indeed the most appropriate for the needs and purposes of the Connecticut regional vocational-technical system.

In the most general terms, the enrollment projection methodology utilized in the research reports cited above involved the identification of a proposed location (Town or Towns) for a potential new regional vocational-technical school, the definition of feeder towns to that location and the assumption of a ten percent application rate to the ninth grade of these vocational-technical schools from the number of students in the public school system who have or shall have completed the eighth grade. These numbers of students were then carried forward from the ninth grade through the twelfth grade in the potential new vocational-

technical school at an 85 percent retention rate. A more complete, detailed statement of this present methodology may be found in the East Hampton and West Haven feasibility reports.

The new enrollment projection methodology developed in this research study is similar to the present method in that it also is based upon the grade-cohort approach, utilizes the concept of feeder towns, and assumes a certain level of applications to regional vocational-technical schools from students completing the eighth grade. However it is different in a number of important respects, of which the major ones are:

- a) for students enrolled in public schools, a distinction in enrollment is made by sex, and separate rates of applications to the ninth grade vocational-technical school is applied separately to boys and girls.
- b) students enrolled in the nonpublic school system are included as potential applicants to the vocational-technical system and separate rates of application are applied to them.
- c) the total number of applicants from public and nonpublic schools is then reduced by the appropriate rate of qualification, i.e., to arrive at the number of qualified applicants to the ninth grade vocational-technical school.
- d) the number of students entering the regional vocational-technical school system at the tenth grade level is allowed for, and finally
- e) two projection series are made: a Series I, which assumes unchanging rates of application to the regional vocational-technical school system, and a Series II, which may assume slowly changing rates of application to this vocational-technical school system.

It should be noted that this methodology does not consider possible enrollment in post-secondary programs, in practical nursing programs, or in other special categories (enrollment in after 3:00 p.m. programs). It is concerned only with potential enrollments in grades nine through twelve as a basic criteria of need for establishment of a new regional vocational-technical school.

Another fundamental difference is that the new enrollment projection methodology is intended to project the number of qualified applicants to the ninth grade of a regional vocational-technical school, not the number of students who might actually enroll. The projections of qualified applicants appear to be a more useful indicator of potential demand than projected future enrollments. The implications of this will be discussed in detail in the following sections but the intent is to arrive at the number of qualified applicants who theoretically could enter the ninth grade if there were no limitations due to school facilities.

The advantages of these alterations and refinements of the projection methodology are many. It allows for greater flexibility in revising projections of future potential enrollments in a new State vocational-technical school as trends change in applications from girls to the vocational-technical system or as trends change in applications from students in the nonpublic school system. It allows for projections to be altered as more of the total applicants are for the ninth grade and fewer for the tenth grade. The new projection methodology also has the capability to reflect changing grade-specific retention rates within the vocational-technical system as a whole. It has the capability of presenting two different projections (depending on the assumptions made) for the proposed school location and is thereby more useful in assessing the requirements for new regional vocational-technical schools. In sum, the new projection methodology is more sensitive to changes in the social,

demographic, and economic factors which affect enrollment in Connecticut's regional vocational-technical school system, and therefore more useful in evaluating the need for expansion of Connecticut's regional vocational-technical school system in response to increasing student demands for this type of career training.

In developing this new enrollment projection methodology the URIC research team recognized the potential important impact the increasing trend of female enrollments may have upon the regional vocational-technical system, hence provided for separate enrollment projections by sex. This provision is neither intended as a means of discrimination against females in vocational education, nor as a criticism of educational policy, rather, it is intended to provide the State Department of Education with a more flexible and accurate measuring device for regional vocational-technical enrollment projections in a period of societal change wherein vocational jobs traditionally held exclusively by men are no longer unavailable to women.

PART II - DESCRIPTION AND DISCUSSION OF NEW ENROLLMENT PROJECTION METHODOLOGY

The new enrollment projection methodology described here and the current projection methodology now being used for Connecticut's regional vocational-technical school system involves two general problems; first, the feasibility of locating a new regional vocational-technical school in a given town in terms of projected enrollment in that school; and second, the projected impact enrollments in the new school would have on the enrollments in existing, near-by regional vocational-technical schools. These two problems are next considered separately, followed by applications of this new methodology to case studies of specific proposed regional vocational-technical school locations (Part III of this report).

Feasibility Projections for Proposed Town Location: Feeder Towns

The first steps in the new methodology are to select a town location for a proposed new regional vocational-technical school and then to project possible enrollments in that school for five years hence. It should be noted that the new methodology and the current methodology both assume a five-year interval before the new regional vocational-technical school is operational. If this interval were shortened to four years, the projections of potential enrollment would have to be altered accordingly.

After the proposed town location has been selected, it is necessary to identify those surrounding towns which will serve as "feeder" towns, i.e., those towns whose students might apply for enrollment in the potential new school. Feeder towns may be grouped into two classes: those whose students would have a choice between applying to the new school or to another near-by existing regional vocational-technical school, and those towns whose students do not have this choice (in other words, towns beyond easy access to a school in the existing regional vocational-technical school system). While

this conceptual distinction is made in both projection methodologies, there are differences in the way feeder towns were identified for the purposes of this research study. In this research study a town was classified as a feeder town to the existing 1973 regional vocational-technical school system (16 schools) only if its borders were contiguous with the borders of the town in which a regional vocational-technical school is located. The only exception to that rule was in the case of the regional vocational-technical school in Ansonia where Shelton was considered a feeder town although Derby lies between them. Norwalk is a similar situation, but was not dealt with in this study. The current regional vocational-technical school system and its feeder towns are listed in Table 1. This means of definition was established for purposes of this research study only and is not a requirement of the computer programmed methodology described later in this report, i.e., any number of feeder towns may be defined independently by the users in each separate application of the computerized projection program.

Applications from Public Schools

Using the location of the current regional vocational-technical schools and their defined feeder towns as listed in Table 1 permits development of accurate application rates to the state-wide system from public schools. The enrollment in the ninth grade in the public school system in the town containing the regional vocational-technical school and the towns identified as feeder towns are presented in Table 2 for the state-wide system from 1969 to 1973. The number of students enrolled in the ninth grade was used throughout this projection methodology as an estimate of the number of students who have completed the eighth grade and are thus eligible for application to the ninth grade in a regional vocational-technical school. It is recognized that not all students

Table 1: Towns Served by Connecticut Regional Vocational-Technical School System

<u>Location of School</u>	<u>Additional Towns Served*</u>
Ansonia	Seymour, Woodbridge*, Orange*, Shelton*, Derby
Bridgeport	Fairfield, Easton, Trumbull, Stratford*
Danbury	New Fairfield, Brookfield, Bethel, Redding, Ridgefield
Danielson	Putnam, Pomfret, Brooklyn, Canterbury, Plainfield, Sterling
Hamden	Prospect*, Cheshire*, Wallingford*, North Haven, New Haven, Woodbridge, Bethany
Hartford	West Hartford, Bloomfield, Windsor, South Windsor*, East Hartford*, Glastonbury*, Wethersfield*, Newington*
Manchester	East Hartford*, South Windsor*, Vernon, Bolton, Glastonbury*
Meriden	Berlin*, Middlefield*, Durham*, Wallingford*, Cheshire*, Southington*
Middletown	Berlin*, Cromwell, Portland, East Hampton, Haddam, Durham*, Middlefield*
Milford	Stratford*, Shelton*, Orange*, West Haven
New Britain	Farmington, Newington*, Berlin*, Southington*, Plainville, Wethersfield*
Norwich	Franklin*, Sprague*, Lisbon, Preston, Ledyard, Montville, Bozrah
Stamford	Greenwich, New Canaan, Darien
Torrington	Goshen, Winchester, Barkhamstead, New Hartford, Harwinton, Litchfield
Waterbury	Watertown, Thomaston, Plymouth, Wolcott, Cheshire*, Prospect*, Naugatuck, Middlebury
Willimantic	Mansfield, Chaplin, Hampton, Scotland, Sprague*, Franklin*, Lebanon, Columbia, Coventry

* As defined for purposes of this research study (see text for explanation); towns with an asterisk must share their potential enrollment with other regional vocational-technical schools.

completing the eighth grade will enroll in the ninth grade (due primarily to out-migration) but the ninth grade enrollment was taken as a better estimate of the potential pool of applicants because an unknown number of students will not complete the eighth grade (due to out-migration and failure).

As may be seen in Table 2, there were 36,793 students in the Connecticut public school system pool of potential applicants to the regional vocational-technical system in 1973, and there were 5,555 applicants to its ninth grade. This represents 15.10 percent of the number of students enrolled in public schools who completed the eighth grade. Every year since 1969 (data on the number of applicants to the ninth grade only were not readily available for years prior) the number and proportion of ninth grade regional vocational-technical school applicants has increased. In terms of relative change, there were 3,678 applicants in 1969 and 5,555 in 1973, representing an increase of 1,877 or 51 percent over the 1969 figure. In terms of the pool of students eligible there were 32,977 in 1969 and 36,793 in 1973, an increase of 3,816 students or 11.6 percent. Thus, the number of applicants to the ninth grade regional vocational-technical system in Connecticut increased more rapidly than did the pool of students in public schools eligible to apply, reflecting increasing interest in career development opportunities in the regional vocational-technical school system.

Applications by Sex from Public School System

At this stage of the analysis an estimate is made for the number of applicants to the ninth grade in regional vocational-technical schools by boys and girls in the public school system. The estimation procedure was required because data on enrollment in the public school system by sex of student and data by sex of applicants to the regional vocational-technical school system were not available.

The number of boys and girls enrolled in the ninth grade in the

Table 2: Ninth Grade Public School System Enrollment by Towns with Vocational-Technical Schools (including Feeder Towns), Connecticut 1969-1973

	<u>Enrollment in Ninth Grade in Town and Feeder Towns</u>				
	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>
Ansonia	1,355	1,530	1,426	1,361	1,177
Bridgeport	4,082	4,221	4,195	3,787	3,821
Danbury	2,209	2,210	2,149	1,957	1,951
Danielson	793	778	822	761	763
Hamden	3,690	3,642	3,608	3,164	3,197
Hartford	5,181	5,381	5,385	5,394	5,434
Manchester	2,305	2,466	2,313	2,144	2,241
Meriden	1,912	1,857	1,931	1,963	1,831
Middletown	1,013	991	929	909	849
Milford	2,055	School opened in 1973 only			
New Britain	2,253	2,456	2,358	2,357	2,357
Norwich	1,572	1,494	1,426	1,330	1,318
Stamford	3,246	3,230	3,316	3,081	3,094
Torrington	1,197	1,186	1,212	1,172	1,129
Waterbury	2,892	2,900	2,945	2,736	2,884
Willimantic	1,038	1,000	1,076	988	931
<u>Totals</u>	<u>36,793</u>	<u>35,342</u>	<u>35,091</u>	<u>33,104</u>	<u>32,977</u>
Applicants to Regional Vocational-Technical Ninth Grade	5,555	5,250	4,719	4,095	3,678
Percent Applicants	15.10	14.85	13.45	12.37	11.15

Source: Public School enrollment data provided by Connecticut Department of Education; number of applicants to Ninth Grade Regional Vocational-Technical Schools from Connecticut State Department of Education, Division of Vocational-Education, Vocational Research Letters 1969 to 1973.

public schools of the towns served by the existing vocational-technical system (as listed in Table 1) were estimated by determining the percent of Connecticut's 14 and 15-year-old populations that were male in 1970. For the state as a whole there were 117,312 persons 14 and 15 years old in 1970 of which 59,698 or 50.89 percent were boys (U. S. Department of Commerce, Bureau of the Census, General Population Characteristics: Connecticut, PC(1)-B8, Table 19). For purposes of this research study the state percentage of males of this age group was applied to the ninth grade enrollment in public schools in the towns served by the present regional vocational-technical school system. Thus, from Table 2 estimates by sex are derived, viz:

<u>Total Ninth Grade</u>	<u>1973</u>	<u>1972</u>
Public Enrollment	36,793	35,342
Estimated Boys	18,724	17,985
Estimated Girls	18,069	17,357

The next stage is to estimate the number of male and female applicants to the ninth grade regional vocational-technical school system. From enrollment data by sex in the regional vocational-technical system it was determined that there were no girls enrolled in the ninth grade in five of the existing sixteen regional vocational-technical schools; namely, those located in Ansonia, Danielson, Manchester, Middletown and Norwich. (Hartford was not included in this group although no girls are enrolled in the ninth grade.) For estimation purposes it was assumed that all of the applicants to the ninth grade in these five schools were boys. To estimate the number of applicants to the ninth grade in these five schools, the appropriate system-wide percentage was applied. The number and percent distribution of total applicants by grade to regional vocational-technical schools in Connecticut from 1969 to 1973 are shown in Table 3.

Under the assumption that 77.6 percent of all applicants were for the

Table 3: Number and Percent Distribution of Total Applicants* by Grade to Regional Vocational-Technical Schools, Connecticut 1969-1973

<u>Number of Applicants</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>
Grade 9	5,555	5,250	4,719	4,095	3,678
Grade 10	1,367	1,347	1,372	1,447	1,461
Grade 11	200	205	190	136	204
Grade 12	40	45	50	49	39
<u>Totals</u>	<u>7,162</u>	<u>6,847</u>	<u>6,331</u>	<u>5,727</u>	<u>5,382</u>

Percent Distribution

Grade 9	77.6	76.7	74.5	71.5	68.3
Grade 10	19.1	19.7	21.7	25.3	27.1
Grade 11	2.8	3.0	3.0	2.4	3.8
Grade 12	.6	.7	.8	.8	.7
<u>Totals</u>	<u>100.1</u>	<u>100.1</u>	<u>100.0</u>	<u>100.0</u>	<u>99.9</u>

* These data exclude applicants to special classes, i.e., nursing, etc.

Source: Connecticut State Department of Education, Division of Vocational Education, Research and Planning Unit, Vocational Research Letters 1969 to 1973.

ninth grade in 1973 and 76.7 percent in 1972, the following ratios of the ninth grade applicants to enrollment in the five towns were derived:

<u>Five Town Data</u>				
<u>Year</u>	<u>Reported Number of Applicants</u>	<u>Estimated Applicants to Ninth Grade</u>	<u>Reported Male Ninth Grade Enrollment</u>	<u>Ratio</u>
1973	1,840	1,428	643	2.2208
1972	1,756	1,347	632	2.1313

These data indicate that for every boy enrolled in the ninth grade in the regional vocational-technical schools in Ansonia, Danielson, Manchester, Middletown and Norwich there were approximately two who applied.

While data on the number of applicants by sex for the entire state-wide system were unavailable, research analyses at the regional vocational-technical school in Waterbury indicates that in 1973 there were 477 boys who applied to the ninth grade and 179 were accepted. This yields a ratio of 2.66 boys applied for every boy accepted and provides a measure of support for the magnitude of the estimated ratios described above.

The ratios derived from pertinent data for the five towns were used as the estimate for the entire vocational-technical system. The estimated number of applicants by sex were then calculated as follows:

State-Wide Regional Vocational-Technical System, Ninth Grade Only

<u>Year and Sex</u>	<u>Reported Enrollment in Ninth Grade</u>	<u>Application Estimation Factor¹</u>	<u>Estimated Number of Applicants²</u>	<u>Percent Distribution</u>
<u>1973</u>				
Boys	2,598	2.00	5,196	93.5
Girls	226	1.60	362	6.5
<u>Totals</u>			<u>5,558</u>	<u>100.0</u>

State-Wide Regional Vocational-Technical System, Ninth Grade Only (continued)

<u>Year and Sex</u>	<u>Reported Enrollment in Ninth Grade</u>	<u>Application Estimation Factor¹</u>	<u>Estimated Number of Applicants²</u>	<u>Percent Distribution</u>
<u>1972</u>				
Boys	2,334	2.13	4,971	94.5
Girls	151	1.90	287	5.5
<u>Totals</u>			<u>5,258</u>	<u>100.0</u>

1. The application estimation factor for girls was deduced after the number of male applicants was determined and the factor for boys in 1973 was rounded to an even two for estimation purposes.
2. The actual number of applicants to the ninth grade was 5,555 in 1973 and 5,250 in 1972.

This estimation procedure shows an increase from 1972 to 1973 in both male and female regional vocational-technical applications to the ninth grade but proportionately the girls increased more rapidly. With this estimated number of applicants to the regional vocational-technical school system ninth grade by sex, an estimate of the application rate by sex from the enrollment in public school systems in towns served by the current regional vocational-technical system (from Table 2) can be made:

<u>Year and Sex</u>	<u>Enrollment in Public Ninth Grade</u>	<u>Estimated Applicants</u>	<u>Estimated Ninth Grade Application Rate</u>
<u>1973</u>			
Boys	18,724	5,196	27.75
Girls	18,069	362	2.00
<u>Totals</u>	<u>36,793</u>	<u>5,558</u>	<u>15.11</u>
<u>1972</u>			
Boys	17,985	4,971	27.64
Girls	17,357	287	1.65
<u>Totals</u>	<u>35,342</u>	<u>5,258</u>	<u>14.88</u>

While it is recognized that there will be local deviations around these percentages, they were taken as the best estimates of applications by sex to the ninth grade for the Connecticut regional vocational-technical system as a whole from public school enrollments. (It should be noted however that the computer program developed in this research study allows the user to specify alternative application rates when additional information suggests such changes are appropriate.)

Again, research analyses at the regional vocational-technical school in Waterbury provide partial support for the general magnitude of these estimated application rates. In 1973, as applicable to the Waterbury regional vocational-technical school, a total of 3,573 students completed the eighth grade in public schools, of which 50.89 percent or 1,818 are estimated to be boys. A total of 477 boys applied to the ninth grade regional vocational-technical school for an application rate of 26.24 percent in 1973. Similarly, the estimated number of girls completing the eighth grade was 1,755 from which 121 applied to the ninth grade for an application rate of 6.8 percent in 1973. While these data are slightly different from those application rates by sex discussed above, they agree in general magnitude with the estimated rates employed in this projection method.

Applications from Nonpublic Schools

Although it is recognized that students enrolled in nonpublic schools also apply to and enroll in the ninth grade of the Connecticut regional vocational-technical school system, no explicit account has been taken of them in the enrollment projection methodology being used currently. The new enrollment projection methodology developed by the URIC research team incorporates this student pool as a separate factor. Table 4 shows the number of students enrolled in the ninth grade in nonpublic schools in towns served by the existing regional vocational-technical system from

Table 4: Enrollment in Ninth Grade for Nonpublic School Systems in Towns Containing Regional Vocational-Technical Schools (including Feeder Towns), Connecticut 1969-1973

<u>Enrollment in Ninth Grade in Town and Feeder Towns</u>					
	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>
Ansonia	4	9	6	13	17
Bridgeport	956	880	891	1,043	1,100
Danbury	210	215	216	280	263
Danielson	147	137	148	125	83
Hamden	542	639	663	707	750
Hartford	1,045	1,025	1,031	1,003	1,131
Manchester	310	317	315	310	317
Meriden	162	170	170	205	227
Middletown	466	435	461	513	579
Milford	443	School opened in 1973 only			
New Britain	440	391	428	488	608
Norwich	1,200	1,163	1,166	1,126	1,217
Stamford	862	845	845	978	719
Torrington	258	256	475	309	263
Waterbury	681	889	927	987	1,084
Willimantic	13	6	2	11	4
Totals	<u>7,739</u>	<u>7,377</u>	<u>7,744</u>	<u>8,098</u>	<u>8,362</u>

Source: Data compiled from enrollment figures provided by Connecticut State Department of Education.

1969 to 1973. Similar to the data for public school enrollment, ninth grade enrollments in nonpublic schools are not available by sex nor is the number of applicants to ninth grade regional vocational-technical schools available. In view of these data limitations and the relatively small numbers of students, it was decided not to attempt estimations of the numbers of students by sex nor separate male and female application rates for nonpublic schools.

Current research analyses at the Waterbury regional vocational-technical school revealed that in 1973 a total of 135 applicants to the ninth grade were students enrolled in nonpublic schools. Data in Table 4 indicates 681 students were enrolled in nonpublic ninth grade in Waterbury and its feeder towns in 1973, which yields a 19.8 percent application rate. In view of the fact that Waterbury had the fifth largest pool of nonpublic students in 1973, it was decided to estimate an application rate of only 10 percent for nonpublic students in the state-wide regional vocational-technical school system.

Qualified Applicants to Regional Vocational-Technical Schools

At this step of the development of the new enrollment projection methodology it is necessary to reduce the total number of applicants, from public and nonpublic students to those qualified to enroll in regional vocational-technical schools. Table 5 shows the percent of the total applicants to regional vocational-technical schools who were qualified (those accepted and those qualified but not accepted) from 1969 to 1973. It may be seen that there is a great deal of variability in these percentages from year to year for any given school, hence it is difficult to predict what the future percent of qualified applicants will be. Also, there is considerable variability from school to school each year. In light of these statistical variabilities, the average 1973 percent for the entire State system (86.3 percent) was taken as the estimated percent

Table 5: Percent of Total Applicants to Regional Vocational-Technical Schools Who Were Qualified (Accepted and Not Accepted), by Schools, Connecticut 1969 to 1973

<u>Schools</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>
Emmett O'Brien (Ansonia)	78.2	78.0	81.2	61.5	78.5
Bullard-Havens (Bridgeport)	72.6	71.5	68.6	68.7	70.6
Henry Abbott (Danbury)	98.7	99.5	65.4	54.1	72.7
H. H. Ellis (Danielson)	93.4	93.9	88.2	95.6	95.1
Eli Whitney (Hamden)	95.6	89.6	88.5	74.8	73.6
A. I. Prince (Hartford)	68.7	90.1	98.9	100.0	97.5
Howell Cheney (Manchester)	87.3	86.0	83.3	81.7	80.6
H. C. Wilcox (Meriden)	84.9	85.3	81.7	83.2	84.1
Vinal (Middletown)	72.1	83.7	82.0	75.4	81.6
Platt (Milford)	77.9	--	--	--	--
E. C. Goodwin (New Britain)	97.2	97.9	96.2	94.0	95.2
Norwich (Norwich)	99.4	97.5	95.3	84.4	85.5
J. M. Wright (Stamford)	83.8	87.0	81.7	86.1	79.8
Oliver Wolcott (Torrington)	99.4	99.2	89.9	88.0	77.7
W. F. Kaynor (Waterbury)	81.5	88.3	85.1	95.7	85.9
Windham (Willimantic)	94.5	97.1	97.3	88.8	94.8
Average	<u>86.3</u>	<u>89.2</u>	<u>85.9</u>	<u>84.0</u>	<u>83.8</u>

Source: Calculated from data given in Connecticut State Department of Education, Division of Vocational Education, Vocational Research Letters 1969 to 1973.

of qualified applicants for evaluation of need for proposed new regional vocational-technical schools. The actual 1973 percent for each school was taken as the estimated value of qualified applicants for the 'impact analysis' portion of the new methodology.

To assess the extent to which qualified applicants are not accepted in the existing regional vocational-technical school system, due primarily to lack of sufficient space, Table 6 was prepared. This Table shows the percentage of total qualified applicants who were not accepted from 1969 to 1973. It indicates that there has been a general trend in Connecticut for the number and percent of qualified applicants not accepted to increase. In 1969 there were 1,195 or 22.7 percent of all qualified applicants not accepted, and this increased each year reaching the high point in 1972 when 2,926 or 41.4 percent of all qualified applicants were not accepted. In 1973 the number and proportion declined to 2,365 or 33.1 percent because a new regional vocational-technical school was opened in Milford. Even if the number of duplicate applications (applications by the same student to more than one regional vocational-technical school), estimated to be 4.5 percent in 1973, were deducted from these figures, on the assumption that all duplicate applicants were qualified, the general conclusion would still remain that a substantial number of qualified applicants are not being accepted by the existing regional vocational-technical school system in Connecticut.

Grade Retention Ratios in Regional Vocational-Technical School System

The new enrollment projection methodology to this point has been concerned with qualified applicants to the ninth grade in the regional vocational-technical school system. It is appropriate to include in the projection techniques a method that reflects entrants into this school system at the tenth grade, eleventh grade, and twelfth grade levels.

Table 6: Percentage of Total Qualified Applicants Who Were Not Accepted at Regional Vocational-Technical Schools, by Schools, Connecticut 1969 to 1973

<u>Schools</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>
Emmett O'Brien (Ansonia)	45.5	43.6	41.1	3.3	9.7
Bullard-Havens (Bridgeport)	17.6	33.1	22.5	17.2	13.2
Henry Abbott (Danbury)	16.4	46.7	16.3	3.5	0.0
H. H. Ellis (Danielson)	16.5	12.9	1.8	3.9	3.3
Eli Whitney (Hamden)	50.7	48.1	49.4	21.0	27.9
A. I. Prince (Hartford)	19.4	40.4	47.6	45.2	35.5
Howell Cheney (Manchester)	39.1	27.3	28.0	25.1	10.6
H. C. Wilcox (Meriden)	33.0	37.1	43.6	43.7	41.7
Vinal (Middletown)	33.2	26.5	17.9	10.9	2.1
Platt (Milford)	0.0	--	--	--	--
E. C. Goodwin (New Britain)	44.1	46.8	50.3	45.7	39.2
Norwich (Norwich)	51.3	50.3	40.1	26.7	22.1
J. M. Wright (Stamford)	12.8	17.8	15.3	22.1	0.0
Oliver Wolcott (Torrington)	42.2	49.7	38.9	35.7	14.8
W. F. Kaynor (Waterbury)	58.3	65.3	64.7	66.9	54.5
Windham (Willimantic)	24.7	36.6	29.2	9.3	1.0
Averages	33.1	41.4	38.3	31.8	22.7
Number of Qualified Applicants Not Accepted	<u>2,365</u>	<u>2,926</u>	<u>2,367</u>	<u>1,750</u>	<u>1,195</u>

Source: Calculated from data given in Connecticut State Department of Education, Division of Vocational Education, Vocational Research Letters 1969 to 1973.

This is particularly important since many of the girls enter the regional vocational-technical school system at the tenth grade level as well as some new male applicants. (The distributions of applicants by grade level was presented in Table 3).

This entrant pattern will be taken into consideration for proposed new school locations by the use of grade-specific retention ratios for the regional vocational-technical system as a whole. Table 7 presents enrollment in the entire Connecticut regional vocational-technical school system by sex of student and grade from 1969 to 1973. Of particular interest is the enrollment in the tenth grade as compared to enrollment in the ninth grade the year before. For both boys and girls the number of tenth graders is larger than the number of ninth graders the year before. Such grade-specific one-year comparisons are the basis for calculation of the retention ratios.

Table 8 shows retention ratios for enrollment in the entire regional vocational-technical school system by sex and grade from 1969 to 1973. As indicated above, there are more tenth graders than there were ninth graders in the previous year, thus the ratio is 104.9 from ninth to tenth grades in 1973. This is due to a greater number of new students entering the system at the tenth grade level than there are ninth grade students who did not continue. This has been the general pattern each year from 1969 to 1973. Retention ratios for girls from grades 9 to 10 have been higher than for boys. In 1973 the number of girls in the tenth grade (255) had a ratio of 168.9 to the number of girls in the ninth grade in 1972 (151), excluding 18 girls enrolled in the regional vocational-technical school in Milford.

The general patterns exhibited by these data indicate that retention ratios are consistently highest for ninth to tenth grades, slightly lower for tenth to eleventh grades (fluctuating around 90), and the lowest

Table 7: Summary Enrollments in Regional Vocational-Technical School System by Sex and Grade, Connecticut 1969 to 1973

<u>Year and Sex</u>		<u>Grade</u>			
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Totals</u>
<u>Totals</u>					
1973	2,815	2,736	2,235	1,937	9,723
1972	2,485	2,451	2,179	1,792	8,907
1971	2,205	2,336	2,069	1,658	8,268
1970	2,208	2,361	1,978	1,715	8,262
1969	2,139	2,297	2,043	1,593	8,072
<u>Males</u>					
1973	2,589	2,463	2,033	1,729	8,814
1972	2,334	2,221	1,967	1,591	8,113
1971	2,131	2,102	1,853	1,480	7,566
1970	2,110	2,106	1,777	1,545	7,538
1969	2,031	2,056	1,848	1,459	7,394
<u>Females</u>					
1973	226	273	202	208	909
1972	151	230	212	201	794
1971	74	234	216	178	702
1970	98	255	201	170	724
1969	108	241	195	134	678

Source: Enrollment data provided by Connecticut State Department of Education, Division of Vocational Education, Research Coordinating Unit.

Table 8: Retention Ratios* for Enrollment in Regional Vocational-Technical School System by Sex and Grade, Connecticut 1969 to 1973

<u>Year and Sex</u>	<u>Retention Ratios from Grade</u>			
	<u>9 to 10</u>	<u>10 to 11</u>	<u>11 to 12</u>	<u>9 to 12</u>
<u>Totals</u>				
1973**	104.9	91.2	88.9	87.7
1972	111.2	93.3	86.6	83.8
1971	105.8	87.6	83.8	90.4
1970	110.4	86.1	83.9	--
1969	125.2	91.5	83.9	--
<u>Males</u>				
1973**	100.8	91.5	87.9	81.9
1972	104.2	93.6	85.9	78.3
1971	99.6	88.0	83.3	82.9
1970	103.7	86.4	83.6	--
1969	115.2	90.2	83.5	--
<u>Females</u>				
1973**	168.9	87.8	98.1	212.2
1972	310.8	90.6	93.1	186.1
1971	238.8	84.7	88.6	356.0
1970	236.1	83.4	87.2	--
1969	482.0	104.8	89.3	--

* Example: The ratio for ninth to tenth grades is the number of students enrolled in the tenth grade in 1973 to the number of students enrolled in the ninth grade in 1972. Ratios for ninth to twelfth are the number of students enrolled in 1973 to the number enrolled in 1970.

** Excludes enrollment in Platt Regional Vocational-Technical School (Milford) in 1973.

Source: Enrollment data provided by Connecticut State Department of Education, Division of Vocational Education, Research Coordinating Unit.

for eleventh to twelfth grades (but with a clear pattern of steady increase from 83.9 in 1969 to 88.9 by 1973). In this research study the grade-specific retention ratios observed for the total enrollment in 1973 were taken as the best estimate of future grade-specific retention ratios for evaluation of proposed new regional vocational-technical school locations.

For purposes of projecting the impact that the opening of a new regional vocational-technical school might have on the number of qualified applicants to a nearby existing regional vocational-technical school, the total number of qualified applicants to the existing schools are projected and then progressed through grades 9 to 12 by use of that school's grade retention ratios. Table 9 presents grade-specific retention ratios for the total enrollment in each regional vocational-technical school for 1973. Grade-specific retention ratios of each school for each year from 1969 to 1973 were calculated but displayed variability described previously for the system as a whole. Although 1973 ratios were taken as the best estimate of future grade retention ratios for each individual school, the computer program developed in this research study allows the user to specify alternate values of grade retention ratios when additional information suggests such changes are necessary.

Double Projection Series

At this stage of the enrollment methodology it is readily apparent that several projections could be made depending upon the number and type of assumptions made concerning each step described previously. For example, the projected applications to regional vocational-technical schools would differ if other assumptions were made concerning changes in rates of application from boys or girls in the public schools; or in application rates from students in nonpublic schools; or in assumed changes in the proportions of qualified applicants; or in assumed changes

Table 9: Grade-Specific Retention Ratios* for Total Enrollment in Each Regional Vocational-Technical School, Connecticut 1973

<u>School</u>	<u>Retention Ratio for Grades</u>			
	<u>9 to 10</u>	<u>10 to 11</u>	<u>11 to 12</u>	<u>9 to 12</u>
Emmett O'Brien (Ansonia)	101.8	94.6	99.1	89.5
Bullard-Havens (Bridgeport)	89.5	91.3	91.3	78.9
Henry Abbott (Danbury)	123.6	101.5	88.3	74.8
H. H. Ellis (Danielson)	118.6	99.1	60.9	102.9
Eli Whitney (Hamden)	97.0	87.0	92.3	94.0
A. I. Prince (Hartford)	119.6	77.8	85.2	104.5
Howell Cheney (Manchester)	91.5	82.2	87.5	51.2
H. C. Wilcox (Meriden)	101.4	85.1	108.2	121.1
Vinal (Middletown)	94.4	90.4	92.0	76.7
Platt (Milford)	--	--	--	--
E. C. Goodwin (New Britain)	127.7	111.6	78.1	105.6
Norwich (Norwich)	105.6	86.5	82.0	74.0
J. M. Wright (Stamford)	89.3	90.1	104.6	92.9
Oliver Wolcott (Torrington)	114.9	86.8	86.6	99.1
W. F. Kaynor (Waterbury)	105.7	86.3	96.0	83.3
Windham (Willimantic)	108.2	101.8	72.8	63.8
Averages	<u>104.9</u>	<u>91.2</u>	<u>88.9</u>	<u>87.7</u>

* Note: See footnote in Table 8 for definition of Retention Ratios. These ratios are not to be confused with "dropout rates", "continuation rates", or similar such measures.

Source: Enrollment data provided by Connecticut State Department of Education, Division of Vocational Education, Research Coordinating Unit.

in grade-specific retention ratios within the regional vocational-technical school system.

Although the computer program for the projection methodology described here has the flexibility to be altered to yield projections based upon other sets of assumptions made within the general framework of the model, for the sake of simplicity and since rates of application were judged to be the crucial variable, two projections of potential applicants to the regional vocational-technical school systems were made. These are referred to as Series I and Series II projections and they differ as follows: Series I assumes unchanging rates of application from boys in the public schools (27.75 percent) and from girls (2.00 percent) in public schools. Series I projections usually yield the lowest projections of applicants. Series II assumes a changing application rate for boys and girls in public schools. The magnitude of this annual change may be specified by the methodology user based on judgments of future events and Series II changes may be positive (increasing) or negative (decreasing) depending upon these judgments. The way in which these changes are specified are discussed in detail in the Technical Manual. However, for purposes of this research the Series II projections assume application rates of boys in public schools will increase 1.0 percent each year beginning from the 1973 rate of 27.0 percent and will increase 1.0 percent per year for girls in public schools beginning from the 1973 rate of 2.0 percent. In other words, the application rate for boys from public schools would be 32 percent in five years from 1973 (by 1978) and 7 percent for girls by 1978. All other assumptions are the same between Series I and Series II. If Series II projections indicate an annual increase, then Series I will yield the lower, more conservative projections. If Series II projections indicate an annual decrease, then Series II will yield the lower, more conservative projections. It is emphasized again that the exact values of the parameters

under Series I and Series II projections may be specified by the methodology user.

Summary of Projection Parameters

The following is a brief summary of the Steps described above to yield two projections of qualified applicants to proposed regional vocational-technical schools:

1. Identify the town of location for the proposed new school.
2. Identify feeder towns.
3. Determine the pool of potential applicants in five years from study date (i.e., 1973) in public and nonpublic school systems
 - a) for those feeder towns that do not share potential students with an existing regional vocational-technical school, use entire enrollments in public and nonpublic schools
 - b) for those feeder towns that share potential students with an existing vocational-technical school, use 1/2 enrollments in public and nonpublic schools.
4. Estimate the number of students available in five years (i.e., 1978) by taking the 1973 enrollments in grades 4 through 1.
5. For public school enrollment, estimate the number of boys and girls enrolled by applying the following percentages:
 - 4th grade - 50.91 percent male (9- and 10-year-olds in state)
 - 3rd grade - 51.13 percent male (8- and 9-year-olds in state)
 - 2nd grade - 51.08 percent male (7- and 8-year-olds in state)
 - 1st grade - 50.96 percent male (6- and 7-year-olds in state)
6. Estimate the number of applicants from public schools by sex by applying two sets of application rates:

	<u>Series I</u>		<u>Series II</u>	
	Application Rates		Application Rates	
	<u>Boys</u>	<u>Girls</u>	<u>Boys</u>	<u>Girls</u>
1978	27.75	2.00	32.0	7.0
1979	27.75	2.00	33.0	8.0

(continued)	<u>Series I</u>		<u>Series II</u>	
	Application Rates		Application Rates	
	<u>Boys</u>	<u>Girls</u>	<u>Boys</u>	<u>Girls</u>
1980	27.75	2.00	34.0	9.0
1981	27.75	2.00	35.0	10.0

7. Estimate the number of applicants from nonpublic enrollment and use this estimate for both Series in Step 6.

<u>Nonpublic Application Rate</u>	
1978	10.0
1979	10.0
1980	10.0
1981	10.0

8. Add estimated applicants from the public school system and nonpublic school systems for Series I and Series II.
9. Reduce these numbers by the qualified applicant rate of 86.3 percent for Series I and Series II.
10. For both Series I and II, carry forward the potential ninth graders by the following retention ratios:

<u>Year</u>		<u>Grade</u>				<u>School Capacity</u>	<u>Percent of Capacity</u>
		<u>9th</u>	<u>10th</u>	<u>11th</u>	<u>12th</u>		
1978		--	--	--	xx	500	xx
1979	new	104.9	--	--	xx	500	xx
1980	en-	104.9	91.2	--	xx	500	xx
1981	tries	104.9	91.2	88.9	xx	500	xx

It should be stressed that this projection methodology yields an estimate of the total number of qualified applicants to the proposed regional vocational-technical school five years from the date of the study. If the number of qualified applicants were all accepted and all reported, then the projections would equal enrollment. Such conditions may be likely during the first and

second year of operation (as, for example, Milford's regional vocational-technical school) but not much longer because the capacity of the new school could be exceeded. It should also be noted that no enrollment is allowed in grades 10 through 12 during the first year a proposed new regional vocational-technical school is opened; no enrollment in grades 11 and 12 during the second year; and no enrollment in grade 12 during the third year. Also, the projection methodology does not indicate conditions more than eight years beyond the date of initial enrollment projection. It also does not indicate which of all possible locations would be optimal for new schools. In other words, while the specific town location in question may be able to support itself in a few years, there could be several alternative locations throughout the state more in need of a regional vocational-technical school.

The key question in deciding whether or not the proposed location for a new regional vocational-technical school is justified is when and to what degree the number of qualified applicants to the ninth grade and students enrolled in other grades exceed the capacity of the facility. When this occurs, some qualified applicants to the ninth grade cannot be accepted. The school officials may then decide upon the number of qualified applicants to the ninth grade that should be accepted in order to ensure full enrollment in their new school.

Projected Impact on Existing Regional Vocational-Technical Schools

The second major concern of this enrollment projection study involves estimating the possible impact of new schools upon the existing regional vocational-technical schools nearby. To accomplish this the same basic methodology described in the preceding paragraphs was utilized with a few simplifications, the major one of which is that enrollment in the public school system is not estimated by sex of student and thus male

and female application rates are not utilized. Instead, application rates for total students enrolled in the public school system are used.

The first steps in the impact consideration are to identify the existing regional vocational-technical schools that might be affected by the new school when it opens and then identify all the feeder towns to the existing regional vocational-technical schools. If this school shares its pool of potential applicants with another school or with the new school when it opens, one-half the enrollment is used, and if not, the entire enrollment is used. This is the same procedure used in the current enrollment projection methodology but, in the new methodology it is applied to public and nonpublic enrollment separately.

Using the Eli Whitney Regional Vocational-Technical School (Hamden) to illustrate this procedure for projecting public enrollment (i.e., the potential pool of applicants to the ninth grade from public students each year) the following Table format would be constructed:

<u>Projected Public Enrollment</u>								
1973 Grade	8th	7th	6th	5th	4th	3rd	2nd	1st
Entering Grade 9 in	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Hamden	xxx	xxx	xxx	etc.	--	--	--	xxx
Feeder Towns	xxx	xxx	xxx	etc.	--	--	--	xxx
1	xxx	xxx	xxx	etc.	--	--	--	xxx
2	xxx	xxx	xxx	etc.	--	--	--	xxx
3	xxx	xxx	xxx	etc.	--	--	--	xxx
etc.								
Total	xxx	xxx	xxx	etc.	--	--	--	xxx

For those feeder towns for Hamden that will share their potential pool of applicants with the new school when it opens in five years (1978), the enrollments in grades 4 through 1 are reduced by one-half.

The sum of the public school enrollment in Hamden and its feeder towns each year represents the pool of potential applicants to Eli Whitney

Regional Vocational-Technical School and a total application rate of 15.10 percent from public schools is used to estimate the number of applicants each year (see page 10 for the derivation of this percent). This number represents the estimated annual number of applicants from public schools to Hamden for Series I projections. Series II projections are accomplished in the same manner except the application rate is assumed to increase one percent annually beginning in 1973 at 15.0 percent.

Enrollment in nonpublic schools in Hamden and its feeder towns is constructed as above, the enrollment in each grade is summed over all towns and a constant application rate of 10.0 is applied to estimate the number of applicants from nonpublic schools. The number for each year is then added to the annual number from public schools under Series I and Series II assumptions to yield a total number of annual applicants to Eli Whitney Regional Vocational-Technical School from 1974 to 1981.

The estimated total number of applicants under Series I and Series II projections are then reduced by applying the 1973 percent qualified for Eli Whitney (see Table 5 for derivation of this percent) to each year. The number of qualified applicants are then entered into the ninth grade of the existing regional vocational-technical school to indicate enrollment which could be achieved if there were no limitations due to space. This Table format may be illustrated as follows:

Affect of "New School" Opening Upon the Projected Qualified Applicants to Eli Whitney Regional Vocational-Technical School

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of Capacity</u>
<u>Present Enrollment</u> (Oct. 1, 1973)	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Series I							
1974	xxx	xxx	xxx	xxx	xxx	xxx	xxx
to	etc.	etc.	etc.	etc.	etc.	etc.	etc.
1981	xxx	xxx	xxx	xxx	xxx	xxx	xxx

(continued)	Grade				Total Projected Maximum Enrollment	Capacity	Percent of Capacity
	9	10	11	12			
Series II							
1974	xxx	xxx	xxx	xxx	xxx	xxx	xxx
to	etc.	etc.	etc.	etc.	etc.	etc.	etc.
1981	xxx	xxx	xxx	xxx	xxx	xxx	xxx

In Series I and Series II the total future potential maximum enrollment was determined by use of 1973 grade-specific retention ratios calculated previously for that particular school (see Table 9). These data would show for each year from 1974 to 1981 the extent to which the potential enrollment would exceed the capacity of the school, assuming all qualified applicants were accepted. When the new school is opened in 1978 the number of qualified applicants to Eli Whitney would decline because some would apply to the new school, but the key question is whether or not this decline in qualified applicants would be great enough to reduce actual enrollment in Eli Whitney. In other words, a reduction in the number of qualified applicants to Eli Whitney may simply mean that this school can accept a larger proportion of those qualified applicants to maintain adequate enrollment levels. Data in Table 6 for Eli Whitney as an example show that 50.7 percent of all qualified applicants were not accepted in 1973. Those students represent a pool of unmet demand for this type of vocational-career education that would be partly served by the new school opening without causing a decline in actual enrollment in the existing regional vocational-technical school (Eli Whitney). This procedure will be illustrated and discussed using actual case studies in the next section (Part III) of this report.

Use of Attrition Rates

Throughout this projection methodology the projected number of students entering the ninth grade in the public school system from 1974 to 1981 were not "corrected" for attrition, as in the case in the projection methodology currently being used. This was not done because the number of students

enrolled in the ninth grade is frequently larger than the number of students enrolled in the fourth grade five years previously due to net in-migration during the interval.

Previous research (Alfred L. Villa, Connecticut's Need For New Teachers 1971-86, Connecticut State Department of Education, Research Bulletin No. 2, Series 1970-71, June 1971, pages 2-4) indicates this pattern for grade by grade persistence percents in Connecticut public schools from 1965 to 1971, viz:

	<u>Percent</u>
1st grade of kindergarten	102.4
2nd grade of 1st	93.4
3rd grade of 2nd	98.7
4th grade of 3rd	100.7
5th grade of 4th	99.4
6th grade of 5th	98.9
7th grade of 5th	99.8
8th grade of 7th	100.2
9th grade of 8th	105.2

The mean of this distribution of persistence percents is 99.86. While these are grade by grade persistence measures and not persistence from fourth grade to ninth grade, other data for 1973 indicate a similar pattern. In 1973 there were 50,924 students enrolled in the ninth grade in public schools and five years prior there were 49,778 students enrolled in the fourth grade. Because of these patterns, projected enrollments were not "corrected" for attrition in this new enrollment projection methodology as they are in the current enrollment projection method.

PART III - ILLUSTRATIVE CASE STUDIES

A. Proposed Location in the Area of the Town of West Haven

This case study was made for comparison to the projection report entitled "A Study to Determine the Need for a Regional-Vocational-Technical School in the Area of the Town of West Haven", by the Connecticut State Department of Education, Division of Vocational Education, January 21, 1974. For brevity, the description of procedure contained in that report is not presented. In this case study (and for those which follow) the feeder town identifications were the same as identified in the published reports, not those identified in Table 1 herein. Since the core of the report consists of tables of projections, the corresponding tables derived with the new computerized enrollment projection methodology were calculated on actual data for the towns in question, viz:

Table A-1: Public School Source of Enrollment for a Proposed West Haven Area Regional Vocational-Technical School

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
West Haven	737	733	741	709
Branford*	173	180	156	132
East Haven*	246	200	209	208
Guilford*	158	157	141	134
Madison*	136	114	116	127
New Haven*	841	865	877	1,009
Orange*	140	131	105	117
Woodbridge*	77	73	56	54
<u>Totals</u>	<u>2,508</u>	<u>2,453</u>	<u>2,401</u>	<u>2,490</u>

* Feeder towns credited with 1/2 of potential enrollment.

Table A-2: Estimated Male and Female Enrollments in Public Schools for West Haven Area

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	2,508	2,453	2,401	2,490
Male Enrollment	1,277	1,254	1,226	1,269
Female Enrollment	1,231	1,199	1,175	1,221

Note: Estimated percent male in 4th grade is 50.91; in 3rd grade is 51.13; in 2nd grade is 51.08; and in 1st grade is 50.96.

Table A-3: Estimated Applicants to Ninth Grade by Sex from Public Schools to a West Haven Regional Vocational-Technical School

<u>Year</u>	<u>Series I*</u>			<u>Series II**</u>		
	<u>Boys</u>	<u>Girls</u>	<u>Total</u>	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
1978	354	24	378	409	74	483
1979	348	24	372	413	83	496
1980	340	24	364	416	94	510
1981	353	24	377	445	110	555

* Series I assumes 27.75 percent for boys and 2.00 percent for girls each year.

** Series II assumes an annual one percent increase for boys and girls beginning in 1973.

Table A-4: Nonpublic School Source of Enrollment for a Proposed West Haven Area Regional Vocational-Technical School

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
West Haven	105	38	33	36
Branford*	24	23	20	23
East Haven*	0	0	0	0
Guilford*	0	0	0	0
Madison*	22	23	21	18
New Haven*	207	108	109	110
Orange*	4	11	10	9
Woodbridge*	3	3	3	3
<u>Totals</u>	<u>365</u>	<u>206</u>	<u>196</u>	<u>200</u>

* Feeder towns credited with 1/2 of potential enrollment.

Table A-5: Estimated Applicants to Ninth Grade from Nonpublic Schools to a West Haven Regional Vocational-Technical School

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Totals	36	21	20	20

Table A-6: Total Estimated Qualified Applicants to Ninth Grade to a West Haven Regional Vocational-Technical School

	Total Applicants		Qualified Applicants*	
	<u>Series I</u>	<u>Series II</u>	<u>Series I</u>	<u>Series II</u>
1978	414	519	358	449
1979	393	517	339	446
1980	384	530	331	457
1981	397	575	343	496

* Qualified rate of 86.3 percent for entire system in 1973.

Table A-7: Projected Qualified Applicants to a West Haven Regional Vocational-Technical School

<u>Year</u>	<u>Grade 9</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>	<u>Total Projected Maximum Enrollment</u>	<u>School Capacity</u>	<u>Percent of Capacity</u>
Series I							
1978	358	0	0	0	358	500	71.6
1979	339	375	0	0	714	500	142.8
1980	331	356	342	0	1,029	500	205.8
1981	343	347	324	304	1,318	500	263.6
Series II							
1978	449	0	0	0	449	500	89.8
1979	446	471	0	0	917	500	183.4
1980	457	468	429	0	1,354	500	270.8
1981	496	480	427	381	1,784	500	356.8

Note: Grade retention ratios are 9th to 10th, 104.9; 10th to 11th, 91.2; 11th to 12th, 88.9.

Findings for West Haven Area Regional Vocational-Technical School

If feeder town identification assumptions are valid, based on the data in Table A-7 a regional vocational-technical school in West Haven could be expected to attain an enrollment of more than 500 by 1979. Series I

projections indicate a slight decline in the number of qualified applicants to the ninth grade by 1981, but the number of students enrolled plus a limited percentage of qualified applicants being accepted would enable West Haven to maintain enrollment capacity. The same general conclusion is provided by Series II projections except that a larger percentage of qualified applicants would not be accepted.

Projected Impact Upon Eli Whitney Regional Vocational-Technical School

Based upon the data for past numbers of qualified applicants to Eli Whitney (469 in 1968, 373 in 1969, 400 in 1970, 640 in 1971, 721 in 1972, and 657 in 1973), the Series I enrollment methodology projects 719 qualified applicants in 1974, shown on Table A-8. If all the qualified applicants were accepted, plus the number of students already enrolled, the total enrollment of Eli Whitney would exceed its capacity by 36.0 percent in 1974. This means that some qualified applicants still could not be accepted. The potential maximum enrollment will continue to exceed the school's capacity with increasing amounts until 1978 when a regional

Table A-8: Affect of a West Haven Regional Vocational-Technical School Upon Projected Qualified Applicants to Eli Whitney Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected</u>	<u>Capacity</u>	<u>Percent of</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>		
Present Enrollment (Oct. 1, 1973)	195	197	174	156	722	912	79.2
Series I							
1974	719	189	171	161	1,240	912	136.0
1975	729	698	165	158	1,750	1,062	164.8
1976	728	707	607	152	2,194	1,062	206.6
1977	752	707	615	560	2,634	1,062	248.0
1978	425	730	615	568	2,338	1,062	220.2
1979	412	412	635	567	2,026	1,062	190.8
1980	399	400	359	586	1,744	1,062	164.2
1981	417	387	348	331	1,483	1,062	139.6

Table A-8 (continued):

	<u>Grade</u>			<u>Total Projected</u>		<u>Capacity</u>	<u>Percent of Capacity</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>		
Series II							
1974	756	189	171	161	1,277	912	140.0
1975	808	733	165	158	1,864	1,062	175.5
1976	852	784	638	152	2,426	1,062	228.4
1977	930	827	682	589	3,028	1,062	285.1
1978	553	902	719	629	2,803	1,062	263.9
1979	565	536	785	664	2,550	1,062	240.1
1980	573	548	466	724	2,311	1,062	217.6
1981	626	556	477	431	2,090	1,062	196.8

* See Tables A-8a and A-8b for derivation of these data. Grade retention ratios are 9 to 10, 97.0; 10 to 11, 87.0; and 11 to 12, 92.3.

vocational-technical school in the West Haven area opens. From 1978 to 1981 the potential maximum enrollment will decline each year and is projected to be 39.6 percent greater than capacity by 1981. These data suggest that the Eli Whitney regional vocational-technical school could maintain capacity enrollments even after the new regional vocational-technical school in the West Haven area opens by accepting a larger proportion of its projected qualified applicants.

Tables A-8a and A-8b are required steps in the impact analysis, hence included for report completeness.

Table A-8a: Projected Ninth Grade Applicant Pool for Eli Whitney Regional Vocational-Technical School, 1974-81

Current Grade (1973)	8	7	6	5	4	3	2	1
<u>Entering Grade 9 in</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Hamden</u>								
Public	768	720	698	698	698	698	698	698
Nonpublic	209	238	117	110	95	86	69	55
<u>Bethany</u>								
Public	0	0	101	90	78	88	87	91
Nonpublic	0	0	0	0	0	0	0	0
<u>Branford *</u>								
Public	370	380	360	348	173	180	156	132
Nonpublic	32	30	34	37	24	23	20	23

Table A-8a (continued):

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>East Haven*</u>								
Public	440	432	430	433	246	200	209	208
Nonpublic	94	93	104	0	0	0	0	0
<u>New Haven *</u>								
Public	1,249	1,351	1,496	1,611	841	865	877	1,009
Nonpublic	495	486	414	419	207	108	109	110
<u>North Branford</u>								
Public	274	273	278	293	259	252	232	240
Nonpublic	0	0	0	0	0	0	0	9
<u>North Haven</u>								
Public	509	504	455	495	433	428	374	386
Nonpublic	0	0	0	0	0	0	0	0
<u>West Haven</u>								
Public	617	670	647	796	0	0	0	0
Nonpublic	243	243	209	111	0	0	0	0
<u>Totals</u>								
Public	4,272	4,330	4,465	4,764	2,728	2,711	2,633	2,764
Nonpublic	1,073	1,090	878	677	326	217	198	188

* Feeder Towns credited with 1/2 potential enrollment beginning in 1978.

Table A-8b: Projected Qualified Applicants to Eli Whitney Regional Vocational-Technical School, 1974-81

	1974	1975	1976	1977	1978	1979	1980	1981
<u>Public Applicants</u>								
Series I	645	654	674	719	412	409	398	417
Series II	684	736	804	905	546	569	579	636
<u>Nonpublic Applicants</u>	107	109	88	68	33	22	20	19
<u>Total Applicants</u>								
Series I	752	763	762	787	445	431	417	436
Series II	791	845	891	973	578	591	599	655
<u>Qualified Applicants*</u>								
Series I	719	729	728	752	425	412	399	417
Series II	756	808	852	930	553	565	573	626

* Based upon a qualified rate of 95.6 percent for Eli Whitney School in 1973.

Projected Impact Upon Platt Regional Vocational-Technical School

Data for the number of qualified applicants to Platt school in 1973 show

that 423 were qualified. In Table A-9 Series I projects 330 qualified applicants in 1974 and Series II projects 347 in 1974. If all qualified applicants were accepted plus the students already enrolled, enrollment at Platt school would exceed its capacity by 20.4 percent in 1975. Series I projections show the total potential maximum enrollment to exceed capacity by 18.0 percent in 1977, 22.4 percent by 1979, and to increase to 29.3 percent over capacity by 1981. Series II projections show the total potential maximum enrollment to exceed capacity by 27.1 percent in 1975 and to increase to 1981. Both projections indicate that Platt Regional Vocational-Technical School could maintain its needed enrollment levels even after West Haven School opens in 1978 by accepting a larger proportion of its projected qualified applicants.

Table A-9: Affect of a West Haven Regional Vocational-Technical School Upon Projected Qualified Applicants to Platt Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of Capacity</u>
Present Enrollment (Oct. 1, 1973)	193	129	0	0	322	800	40.2
Series I							
1974	330	202	118	0	650	800	81.3
1975	327	346	185	105	963	800	120.4
1976	299	343	316	164	1,122	1,000	112.2
1977	273	313	313	281	1,180	1,000	118.0
1978	351	287	286	278	1,202	1,000	120.2
1979	339	369	262	254	1,224	1,000	122.4
1980	327	356	336	233	1,252	1,000	125.2
1981	326	343	325	299	1,293	1,000	129.3
Series II							
1974	347	202	118	0	667	800	83.4
1975	363	364	185	105	1,017	800	127.1
1976	349	381	332	164	1,226	1,000	122.6
1977	335	366	347	295	1,343	1,000	134.3
1978	456	352	334	309	1,451	1,000	145.1
1979	463	478	321	297	1,559	1,000	155.9
1980	466	486	436	285	1,673	1,000	167.3
1981	485	489	443	388	1,805	1,000	180.5

* See Tables A-9a and 9b for derivation of these data. Retention ratios for the state system in 1973 were employed: from 9 to 10, 104.9; 10 to 11, 91.2; and 11 to 12, 88.9.

Tables A-9a and A-9b are required steps in the impact analysis, hence included for report completeness.

Table A-9a: Projected Ninth Grade Applicant Pool for Platt Regional Vocational-Technical School, 1974-81

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>Milford</u>								
Public	940	877	410	102	1,204	1,204	1,204	1,204
Nonpublic	131	139	126	133	139	102	118	106
<u>Orange</u>								
Public	0	0	316	308	280	261	210	234
Nonpublic	15	21	11	16	8	21	20	18
<u>Shelton</u>								
Public	512	535	548	571	565	542	529	521
Nonpublic	89	95	81	84	87	70	66	57
<u>Derby*</u>								
Public	92	81	83	93	95	92	74	77
Nonpublic	35	23	21	21	25	8	8	8
<u>Stratford*</u>								
Public	369	366	331	365	330	330	317	298
Nonpublic	75	77	78	84	77	64	58	64
<u>West Haven*</u>								
Public	309	335	324	398	0	0	0	0
Nonpublic	122	122	105	56	0	0	0	0
<u>Totals</u>								
Public	2,222	2,194	2,012	1,837	2,474	2,429	2,334	2,334
Nonpublic	467	477	422	394	336	265	270	253

* Feeder Towns credited with 1/2 potential applicants.

Table A-9b: Projected Qualified Applicants* to Platt Regional Vocational-Technical School, 1974-81

	1974	1975	1976	1977	1978	1979	1980	1981
<u>Public Applicants</u>								
Series I	336	331	304	277	374	367	352	352
Series II	356	373	362	349	495	510	513	537
<u>Nonpublic Applicants</u>	47	48	42	39	34	26	27	25
<u>Total Applicants</u>								
Series I	382	379	346	317	407	393	379	378
Series II	402	421	404	388	528	537	540	562
<u>Qualified Applicants</u>								
Series I	330	327	299	273	351	339	327	326
Series II	347	363	349	335	456	463	466	485

* Based upon a qualification rate of 86.3 for Platt School in 1973.

General Conclusions on Location of a Regional Vocational-Technical School
in the Area of the Town of West Haven

The general conclusion reached on the basis of the new projection methodology is that a new vocational-technical school in West Haven would be justified and that its opening would not appreciably decrease enrollments in existing vocational-technical schools. These findings are in disagreement with those based on the current projection methodology in the above cited published report.

PART III - ILLUSTRATIVE CASE STUDIES (continued)

B. Proposed Location in the Area of the Town of East Hampton

This second example should be taken in comparison to the existing projection report entitled "A Study to Determine the Need for a Regional-Vocational-Technical School in the Area of the Town of East Hampton", by the Connecticut State Department of Education, Division of Vocational Education, December 21, 1973. Feeder towns used here are the same as identified in the published report and all Tables employ actual enrollment data.

Table B-1: Public School Source of Enrollment for a Proposed East Hampton Area Regional Vocational-Technical School

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
East Hampton	169	180	168	165
Colchester	146	174	159	143
East Haddam	101	80	101	101
Marlborough	93	71	75	88
East Lyme*	149	94	104	97
Glastonbury*	229	232	237	216
¹ Haddam*	97	92	77	86
Killingworth*	0	0	0	0
Hebron*	61	63	62	64
Lyme*	67	61	53	60
Old Lyme*	0	0	0	0
Portland*	83	71	80	71
Salem*	18	21	18	22
<u>Totals</u>	<u>1,213</u>	<u>1,139</u>	<u>1,134</u>	<u>1,113</u>

¹Data are 1/2 enrollment figures in 1973 for Regional School District 17.

* Feeder towns credited with 1/2 of potential enrollment.

Table B-2: Estimated Male and Female Enrollments in
Public Schools for East Hampton Area

Entering Grade 9 in	1978	1979	1980	1981
Present Grade Enrollment	1,213	1,139	1,134	1,113
Male Enrollment	618	582	579	567
Female Enrollment	595	557	555	546

Note: Estimated percent male in 4th grade is 50.91; in 3rd grade is 51.13; in 2nd grade is 51.08; and in 1st grade is 50.96.

Table B-3: Estimated Applicants to Ninth Grade by Sex from Public
Schools to an East Hampton Regional Vocational-Technical School

Year	Series I*			Series II**		
	Boys	Girls	Total	Boys	Girls	Total
1978	172	12	184	198	36	234
1979	162	13	175	192	38	230
1980	163	13	176	197	44	241
1981	156	12	168	199	49	248

* Series I assumes 27.75 percent for boys and 2.00 percent for girls each year.

** Series II assumes an annual one percent increase for boys and girls beginning in 1973.

Table B-4: Nonpublic School Source of Enrollment for a Proposed
East Hampton Area Regional Vocational-Technical School

Entering Grade 9 in	1978	1979	1980	1981
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
East Hampton	0	0	0	0
Colchester	0	0	0	0
East Haddam	1	0	0	0
Marlborough	0	0	0	0
East Lyme*	0	0	0	0
Glastonbury*	0	0	0	0
Haddam	0	0	0	0
Hebron	0	0	0	0
Lyme	0	0	0	0
Old Lyme*	0	0	0	0
Portland*	0	0	0	0
Salem*	0	0	0	0
Totals	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>

* Feeder Towns credited with 1/2 of potential enrollment.

Table B-5: Estimated Applicants to Ninth Grade from Nonpublic Schools to an East Hampton Regional Vocational-Technical School

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Totals	0	0	0	0

Table B-6: Total Estimated Qualified Applicants to Ninth Grade to an East Hampton Regional Vocational-Technical School

	Total Applicants		Qualified Applicants*	
	<u>Series I</u>	<u>Series II</u>	<u>Series I</u>	<u>Series II</u>
1978	184	234	159	202
1979	175	230	151	199
1980	176	241	152	208
1981	168	248	145	214

* Qualified Rate of 86.3 percent for entire system in 1973.

Table B-7: Projected Qualified Applicants to an East Hampton Regional Vocational-Technical School

<u>Year</u>	<u>Grade 9</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>	<u>Total Projected Maximum Enrollment</u>	<u>School Capacity</u>	<u>Percent of Capacity</u>
Series I							
1978	159	0	0	0	159	500	31.8
1979	151	167	0	0	318	500	63.6
1980	152	158	152	0	462	500	92.4
1981	145	159	145	135	584	500	116.8
Series II							
1978	202	0	0	0	202	500	40.4
1979	199	212	0	0	411	500	82.2
1980	208	208	193	0	609	500	121.8
1981	214	219	190	172	794	500	158.8

Note: Grade retention ratios are 9 to 10, 104.9; 10 to 11, 91.2; and 11 to 12, 88.9.

Findings for East Hampton Area Regional Vocational-Technical School

If feeder town identifications are valid, based on data in Table B-7, a regional vocational-technical school in East Hampton might be expected to attain an enrollment of 500 by 1981 if all qualified applicants were

accepted and reported to school. However, Series I projections show an annual decline in the number of qualified applicants to the ninth grade. Under Series II assumptions, an enrollment of 500 might be attained by 1980 and the annual number of qualified applicants to the ninth grade show a slow increase. Both Series I and Series II projections suggest that all qualified applicants would have to be accepted and actually report to class if the proposed school were to reach capacity. Thus the probable margin of success appears too small to warrant a new regional vocational-technical school in East Hampton at the present time.

Although a negative conclusion on feasibility for location of a regional vocational-technical school in the East Hampton area has been made, the below impact analysis was made to further assess this conclusion.

Projected Impact Upon Vinal Regional Vocational-Technical School

Data for the number of qualified applicants to Vinal show 142 were qualified in 1969, 156 in 1970, 223 in 1971, 257 in 1972, and 196 in 1973. In Table B-8, Series I projects 246 qualified applicants in 1974. If all qualified applicants were accepted plus the students already enrolled, Vinal could attain 97.6 percent of its new capacity in 1974. This could increase each year until 1978 when East Hampton might open, at which time the total projected maximum enrollment would decline each year reaching only 15 percent over capacity by 1981. Series II projections offer a similar pattern except that by 1981 the projected maximum enrollment could exceed capacity by 62 percent. Based on these projections, the opening of a regional vocational-technical school in East Hampton in 1978 would have a marked depressing affect upon the number of potential qualified applicants to Vinal.

Table B-8: Affect of an East Hampton Regional Vocational-Technical-School
Upon Projected Qualified Applicants to Vinal Regional Vocational-
Technical School*

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of</u> <u>Capacity</u>
Present Enrollment (Oct. 1, 1973)	120	119	103	92	434	348	124.7
Series I							
1974	246	113	108	95	562	576	97.6
1975	244	232	102	99	677	576	117.5
1976	245	230	210	94	779	576	135.2
1977	249	231	208	193	881	576	153.0
1978	191	235	209	192	827	576	143.6
1979	187	180	213	192	772	576	134.0
1980	180	177	163	196	716	576	124.3
1981	184	169	160	150	663	576	115.1
Series II							
1974	260	113	108	95	576	576	100.0
1975	273	245	102	99	719	576	124.8
1976	290	258	222	94	864	576	150.0
1977	311	273	233	204	1,021	576	177.3
1978	250	294	247	214	1,005	576	174.5
1979	257	236	266	227	986	576	171.2
1980	258	243	213	244	958	576	166.3
1981	276	243	219	196	934	576	162.2

* See Appendix B-8a and B-8b for derivation of these data. Grade-specific retention ratios are 9 to 10, 94.4; 10 to 11, 90.4; 11 to 12, 92.0.

Table B-8a: Projected Ninth Grade Applicant Pool for Vinal Regional
Vocational-Technical School, 1974-81

<u>Current Grade (1973)</u> <u>Entering Grade 9 in</u>	<u>8</u> <u>1974</u>	<u>7</u> <u>1975</u>	<u>6</u> <u>1976</u>	<u>5</u> <u>1977</u>	<u>4</u> <u>1978</u>	<u>3</u> <u>1979</u>	<u>2</u> <u>1980</u>	<u>1</u> <u>1981</u>
<u>Middletown</u>								
Public	574	502	518	496	539	562	527	556
Nonpublic	97	100	112	94	98	96	97	85
<u>Cromwell</u>								
Public	159	165	159	189	147	146	160	151
Nonpublic	0	0	0	0	0	0	0	0
<u>Durham Reg. #13</u>								
Public	204	209	195	218	170	185	165	155
Nonpublic	0	0	0	0	0	0	0	0
<u>East Haddam</u>								
Public	100	79	91	107	51	40	51	51
Nonpublic	18	31	9	11	1	0	0	0
<u>East Hampton</u>								
Public	172	169	186	188	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Haddam Reg. #17 *</u>								
Public	157	181	193	192	97	92	77	86
Nonpublic	0	0	0	0	0	0	0	0

Table B-8a (continued):

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>Portland *</u>								
Public	189	204	153	179	83	71	80	71
Nonpublic	0	0	0	0	0	0	0	0
² <u>Chester *</u>								
Public	0	0	29	30	35	27	22	26
Nonpublic	0	0	0	0	0	0	0	0
<u>Clinton *</u>								
Public	101	114	110	119	126	109	120	133
Nonpublic	0	0	0	0	0	0	0	0
¹ <u>Colchester *</u>								
Public	146	144	158	158	73	87	80	72
Nonpublic	0	0	0	0	0	0	0	0
<u>Deep River *</u>								
Public	0	0	41	29	42	35	28	38
Nonpublic	6	7	3	0	0	0	0	0
³ <u>Essex *</u>								
Public	0	0	33	30	37	38	27	35
Nonpublic	0	0	0	0	0	0	0	0
<u>Madison *</u>								
Public	135	140	133	123	136	114	116	127
Nonpublic	22	23	26	23	22	23	21	18
<u>Old Saybrook *</u>								
Public	110	98	107	101	92	87	78	82
Nonpublic	0	0	0	0	0	0	0	0
<u>Rocky Hill *</u>								
Public	76	87	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Westbrook *</u>								
Public	40	42	43	46	45	47	40	36
Nonpublic	0	0	0	0	0	0	0	0
<u>Totals</u>								
Public	2,163	2,134	2,149	2,205	1,673	1,640	1,571	1,619
Nonpublic	143	161	150	128	121	119	118	103

* Feeder Towns credited with 1/2 potential enrollment in 1978.

1) Town credited with 1/2 potential enrollment in 1978.

2) Chester has no enrollment in public school eighth and seventh grades.

3) Essex has enrollment in grades K-6 only.

Table B-8b: Projected Qualified Applicants to Vinal Regional Vocational-Technical School, 1974-81

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Public Applicants</u>								
Series I	327	322	324	333	253	248	237	244
Series II	346	363	387	419	335	344	346	372
<u>Nonpublic Applicants</u>	14	16	15	13	12	12	12	10
<u>Total Applicants</u>								
Series I	341	338	339	346	265	260	249	255
Series II	360	379	402	432	347	356	357	383
<u>Qualified Applicants*</u>								
Series I	246	244	245	249	191	187	180	184
Series II	260	273	290	311	250	257	258	276

* Based on a qualified rate of 72.1 percent for Vinal in 1973.

General Conclusions on Location of a Regional Vocational-Technical School
in the Area of the Town of East Hampton

The general conclusions of the two separate studies (new methodology and prior methodology) agree that a new regional vocational-technical school located in East Hampton should not be considered feasible. A new regional vocational-technical school located in this area would have real problems in attaining enrollment capacity, as well as a serious negative affect upon enrollments to Vinal Regional Vocational-Technical School in Middletown.

PART III - ILLUSTRATIVE CASE STUDIES (continued)

C. Proposed Location in the Area of Bristol-Plymouth-Thomaston

This third example should be taken in comparison to the existing report entitled "A Study to Determine the Need for a Regional-Vocational-Technical School in the Bristol-Plymouth-Thomaston Area", by the Connecticut State Department of Education, Division of Vocational Education, January 21, 1974. Feeder towns used here are the same as identified in the published report. All Tables employ actual enrollment data.

Table C-1: Public School Source of Enrollment for a Proposed Bristol-Plymouth-Thomaston Area Regional Vocational-Technical School

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Bristol	927	857	883	914
Plymouth	204	203	191	204
Thomaston	122	121	116	130
Bethlehem	0	0	0	0
Burlington	210	219	203	198
Morris	0	0	0	0
Washington	101	111	95	71
Harwinton*	0	0	0	0
Litchfield*	119	118	102	94
Watertown*	169	187	188	189
Wolcott*	153	159	154	142
Totals	<u>2,005</u>	<u>1,975</u>	<u>1,932</u>	<u>1,942</u>

* Feeder Towns credited with 1/2 of potential enrollment.

Table C-2: Estimated Male and Female Enrollments in Public Schools for Bristol-Plymouth-Thomaston Area

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	2,005	1,975	1,932	1,942
Male Enrollment	1,021	1,010	987	990
Female Enrollment	984	965	945	952

Note: Estimated percent male in 4th grade is 50.91; in 3rd grade is 51.13; in 2nd grade is 51.08; and in 1st grade is 50.96.

Table C-3: Estimated Applicants to Ninth Grade by Sex from Public Schools to a Bristol-Plymouth-Thomaston Regional Vocational-Technical School

<u>Year</u>	<u>Series I*</u>			<u>Series II**</u>		
	<u>Boys</u>	<u>Girls</u>	<u>Total</u>	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
1978	284	20	304	326	60	386
1979	282	19	301	334	66	400
1980	273	20	293	335	76	411
1981	274	19	293	346	85	431

* Series I assumes 27.75 percent for boys and 2.00 percent for girls each year.

** Series II assumes an annual one percent increase for boys and girls beginning in 1973.

Table C-4: Nonpublic School Source of Enrollment for a Proposed Bristol-Plymouth-Thomaston Area Regional Vocational-Technical School

<u>Entering Grade 9 in</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Bristol	263	237	208	211
Plymouth	0	0	0	0
Thomaston	0	0	0	0
Bethlehem	0	0	0	0
Burlington	0	0	0	0
Morris	0	0	0	0
Washington	12	8	7	5
Harwinton	0	0	0	0
Litchfield	0	0	0	0
Watertown	11	13	15	7
Wolcott	0	0	0	0
<u>Totals</u>	<u>286</u>	<u>258</u>	<u>230</u>	<u>223</u>

* Feeder Towns credited with 1/2 of potential enrollment.

Table C-5: Estimated Applicants to Ninth Grade from Nonpublic Schools to a Bristol-Plymouth-Thomaston Regional Vocational-Technical School

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Totals	29	26	23	22

Table C-6: Total Estimated Qualified Applicants to Ninth Grade to a
Bristol-Plymouth-Thomaston Regional Vocational-Technical School

	Total Applicants		Qualified Applicants*	
	<u>Series I</u>	<u>Series II</u>	<u>Series I</u>	<u>Series II</u>
1978	333	415	287	358
1979	327	426	282	368
1980	316	434	273	375
1981	315	453	272	391

* Qualified rate of 86.3 percent for entire system in 1973.

Table C-7: Projected Qualified Applicants to a Bristol-Plymouth-Thomaston
Regional Vocational-Technical School

<u>Year</u>	<u>Grade 9</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>	<u>Total Projected Maximum Enrollment</u>	<u>School Capacity</u>	<u>Percent of Capacity</u>
Series I							
1978	287	0	0	0	287	500	57.4
1979	282	301	0	0	583	500	116.6
1980	273	296	275	0	844	500	168.8
1981	272	286	270	244	1,072	500	214.4
Series II							
1978	358	0	0	0	358	500	71.6
1979	368	376	0	0	744	500	148.8
1980	375	386	342	0	1,103	500	220.6
1981	391	393	352	304	1,440	500	288.0

Note: Grade retention ratios are 9th to 10th, 104.9; 10th to 11th, 91.2; 11th to 12th, 88.9.

Findings for Bristol-Plymouth-Thomaston Area Regional Vocational-Technical School

Based on the data in Table C-7 a regional vocational-technical school located in this area could be expected to attain an enrollment of over 500 in 1979 by both projection series. Series I projects a slight decline in the number of qualified applicants to the ninth grade by 1981, but enrollment levels could be maintained by accepting a larger proportion of the qualified applicants. Series II projections yield the same supporting conclusion except the total projected maximum enrollment may exceed capacity by 188 percent by 1981.

Projected Impact Upon E. C. Goodwin Regional Vocational-Technical School

Based upon the data for past numbers of qualified applicants to the E. C. Goodwin school (830 in 1973; 786 in 1972; 710 in 1971; 578 in 1970), as shown in Table C-8, Series I projects 574 qualified applicants in 1974 and Series II projects 604 in 1974. Both projection Series indicate that the total projected maximum enrollment could be attained by 1974 and would continue to exceed capacity even after 1978 when the new regional vocational-technical school opens. Thus, the projected impact upon E. C. Goodwin Regional Vocational-Technical School in New Britain would be insignificant.

Table C-8: Affect of a Bristol-Plymouth-Thomaston Regional Vocational-Technical School Upon Projected Qualified Applicants to E. C. Goodwin Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of</u>
<u>Present Enrollment</u> (Oct. 1, 1973)	234	249	251	171	905	906	99.9
Series I							
1974	574	299	278	196	1,347	906	148.7
1975	559	733	333	217	1,842	906	203.3
1976	562	714	819	260	2,355	906	259.9
1977	562	717	797	639	2,715	906	299.7
1978	558	718	801	623	2,700	906	298.0
1979	519	713	801	625	2,658	906	293.4
1980	509	663	795	626	2,593	906	286.2
1981	497	650	740	621	2,508	906	276.8
Series II							
1974	604	299	278	196	1,377	906	152.0
1975	620	771	333	217	1,941	906	214.2
1976	661	792	861	260	2,574	906	284.1
1977	697	844	884	672	3,097	906	341.8
1978	727	890	941	690	3,248	906	358.5
1979	711	928	994	735	3,368	906	371.7
1980	729	907	1,036	776	3,448	906	380.6
1981	743	932	1,013	809	3,497	906	386.0

* See Tables C-8a and C-8b for derivation of these data. Grade retention ratios are 9 to 10, 127.7; 10 to 11, 111.6; and 11 to 12, 78.1.

Tables C-8a and C-8b are required steps in the impact analysis, hence included for report completeness.

Table C-8a: Projected Ninth Grade Applicant Pool for E. C. Goodwin Regional Vocational-Technical School, 1974-81

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>New Britain</u>								
Public	915	874	944	1,010	1,010	932	1,020	1,053
Nonpublic	295	230	158	150	148	93	76	87
<u>Farmington</u>								
Public	282	288	304	284	300	289	258	252
Nonpublic	0	0	0	0	0	0	0	0
<u>Plainville</u>								
Public	293	308	321	308	315	330	326	248
Nonpublic	43	66	0	0	0	0	0	0
<u>Avon*</u>								
Public	92	97	95	96	98	81	78	93
Nonpublic	0	0	0	0	0	0	0	0
<u>Berlin*</u>								
Public	143	141	125	142	145	127	107	98
Nonpublic	32	38	34	0	0	0	0	0
<u>Bristol*</u>								
Public	428	416	445	423	464	429	442	457
Nonpublic	143	153	137	128	132	119	104	106
<u>Burlington*</u>								
Public	102	82	89	107	105	110	102	99
Nonpublic	0	0	0	0	0	0	0	0
<u>Newington*</u>								
Public	245	236	253	261	294	270	258	237
Nonpublic	26	24	38	1	1	2	2	2
<u>Plymouth*</u>								
Public	103	112	107	99	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Southington*</u>								
Public	923	281	335	357	351	363	320	346
Nonpublic	64	73	0	0	0	0	0	0
<u>West Hartford*</u>								
Public	487	459	489	478	462	409	374	327
Nonpublic	198	198	117	121	109	82	96	68
<u>Totals</u>								
Public	3,383	3,294	3,507	3,565	3,544	3,340	3,285	3,210
Nonpublic	801	782	484	400	390	296	278	263

* Feeder Towns credited with 1/2 potential enrollment beginning in 1978.

Table C-8b: Projected Qualified Applicants to E. C. Goodwin Regional Vocational-Technical School, 1974-81

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Public Applicants*</u>								
Series I	511	497	530	538	535	504	496	485
Series II	541	560	631	677	709	701	723	738
<u>Nonpublic Applicants</u>	80	78	48	40	39	30	28	26
<u>Total Applicants</u>								
Series I	591	576	578	578	574	534	524	511
Series II	621	638	680	717	748	731	750	765
<u>Qualified Applicants</u>								
Series I	574	559	562	562	558	519	509	497
Series II	604	620	661	697	727	711	729	743

* Based upon a qualified rate of 97.2 percent for E. C. Goodwin School in 1973.

Projected Impact Upon W. F. Kaynor Regional Vocational-Technical School

Based upon the data for past numbers of qualified applicants to the W. F. Kaynor school (559 in 1973; 704 in 1972; 567 in 1971; 553 in 1970), Series I projects 474 qualified applicants in 1974 and Series II projects 499, as shown in Table C-9. Series I projections indicate that enrollment capacity could be exceeded by 1974 and would continue to exceed capacity after 1978 but at declining proportions. Series II suggests capacity would be exceeded by 1974 and increase each year to 1981. Thus the impact of the new school opening upon enrollments in W. F. Kaynor school in Waterbury would be negligible.

Table C-9: Affect of a Bristol-Plymouth-Thomaston Regional Vocational-Technical School Upon Projected Qualified Applicants to W. F. Kaynor Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of</u>
<u>Present Enrollment</u>							
(Oct. 1, 1973)	178	186	139	120	623	804	77.5
<u>Series I</u>							
1974	474	188	161	133	956	804	118.9
1975	482	501	162	154	1,299	984	132.0
1976	465	510	432	156	1,563	984	158.8

Table C-9 (continued):

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of Capacity</u>
1977	463	492	440	415	1,810	984	183.9
1978	385	489	425	422	1,721	984	174.9
1979	393	407	422	408	1,630	984	165.7
1980	382	416	351	405	1,554	984	157.9
1981	397	403	359	337	1,496	984	152.0
Series II							
1974	499	188	161	133	981	804	122.0
1975	535	527	162	154	1,378	984	140.0
1976	543	566	455	156	1,720	984	174.8
1977	570	574	488	437	2,069	984	210.3
1978	496	602	496	469	2,063	984	209.7
1979	532	524	520	476	2,052	984	208.5
1980	540	563	452	499	2,054	984	208.7
1981	588	571	486	434	2,079	984	211.3

* See Tables C-9a and 9b for derivation of these data. Grade-specific retention ratios are 9 to 10, 105.7; 10 to 11, 86.3; and 11 to 12, 96.0.

Tables C-9a and C-9b are required steps in the impact analysis, hence included for report completeness.

Table C-9a: Projected Ninth Grade Applicant Pool for W. F. Kaynor Regional Vocational-Technical School, 1974-81

<u>Current Grade (1973)</u> <u>Entering Grade 9 in</u>	<u>8</u> <u>1974</u>	<u>7</u> <u>1975</u>	<u>6</u> <u>1976</u>	<u>5</u> <u>1977</u>	<u>4</u> <u>1978</u>	<u>3</u> <u>1979</u>	<u>2</u> <u>1980</u>	<u>1</u> <u>1981</u>
<u>Waterbury</u>								
Public	1,362	1,369	1,332	1,344	1,381	1,404	1,459	1,537
Nonpublic	554	619	568	489	489	405	360	331
<u>Middlebury</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Naugatuck</u>								
Public	386	410	366	412	399	453	423	490
Nonpublic	67	60	59	64	48	52	48	47
<u>Oxford</u>								
Public	125	127	110	115	133	123	97	136
Nonpublic	0	0	0	0	0	0	0	0
<u>Plymouth</u>								
Public	206	223	213	198	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0

Table C-9a (continued):

Current Grade (1973) Entering Grade 9 in	8 1974	8 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>Roxbury</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Southbury</u>								
Public	257	224	224	230	227	254	211	196
Nonpublic	0	0	0	0	0	0	0	0
<u>Thomaston**</u>								
Public	103	116	99	125	61	61	58	65
Nonpublic	47	31	35	0	0	0	0	0
<u>Watertown**</u>								
Public	310	349	350	383	169	187	188	189
Nonpublic	63	63	63	26	11	13	15	7
<u>Wolcott**</u>								
Public	324	318	331	304	153	159	154	142
Nonpublic	0	0	0	0	0	0	0	0
<u>Woodbury</u>								
Public	170	155	156	151	125	119	111	107
Nonpublic	0	0	0	0	0	0	0	0
<u>Beacon Falls*</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Prospect*</u>								
Public	125	116	121	114	119	126	119	105
Nonpublic	0	0	0	0	0	0	0	0
<u>Totals</u>								
Public	3,368	3,407	3,302	3,376	2,767	2,886	2,820	2,967
Nonpublic	731	773	725	579	548	470	423	385

* Feeder Towns credited with 1/2 enrollment.

** Feeder Towns credited with 1/2 enrollment in 1978.

Table C-9b: Projected Qualified Applicants* to W. F. Kaynor Regional Vocational-Technical School, 1974-81

	1974	1975	1976	1977	1978	1979	1980	1981
<u>Public Applicants</u>								
Series I	509	514	499	410	418	436	426	448
Series II	539	579	594	641	553	606	620	682
<u>Nonpublic Applicants</u>	73	77	72	58	55	47	42	38
<u>Total Applicants</u>								
Series I	582	592	571	563	473	483	468	487
Series II	612	656	667	699	608	653	663	721
<u>Qualified Applicants</u>								
Series I	474	482	465	463	385	393	382	397
Series II	499	535	543	570	496	532	540	588

* Based on a qualification rate of 81.5 for W. F. Kaynor School in 1973.

Projected Impact Upon Oliver Wolcott Regional Vocational-Technical School

Based upon the data for past numbers of qualified applicants to the Oliver Wolcott school (358 in 1973; 396 in 1972; 321 in 1971; 294 in 1970), as shown in Table C-10, Series I projects 279 qualified applicants in 1974 and Series II projects 294. Series I suggests the capacity at Oliver Wolcott would be exceeded by 1974 but when the new school opens in 1978, the total projected maximum enrollment would decline each year to only 16.4 percent above capacity by 1981. Series II offers the same pattern after 1978 but at higher levels. It is recommended that the more conservative Series I projections be given the greatest weight and it be concluded that by 1981 the new school opening would have a serious depressing impact upon the enrollment in Oliver Wolcott.

Table C-10: Affect of a Bristol-Plymouth-Thomaston Regional Vocational-Technical School Upon Projected Qualified Applicants to Oliver Wolcott Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected</u>		<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Maximum Enrollment</u>	<u>Capacity</u>	<u>of</u> <u>Capacity</u>
<u>Present Enrollment</u> (Oct. 1, 1973)	151	162	131	116	560	594	94.3
Series I							
1974	279	173	141	113	706	594	118.9
1975	278	321	151	122	872	714	122.1
1976	248	319	279	130	976	714	136.7
1977	261	284	277	241	1,063	714	148.9
1978	226	300	247	240	1,013	714	141.9
1979	213	259	260	214	946	714	132.5
1980	201	245	225	226	897	714	125.6
1981	192	231	213	195	831	714	116.4
Series II							
1974	294	173	141	113	721	594	121.4
1975	309	338	151	122	920	714	128.9
1976	291	356	294	130	1,071	714	150.0
1977	323	334	309	254	1,220	714	170.9
1978	293	371	290	267	1,221	714	171.0
1979	291	337	322	251	1,201	714	168.2
1980	287	334	292	279	1,192	714	166.9
1981	286	330	290	253	1,159	714	162.3

* See Tables C-10a and 10b for derivation of these data. Grade-specific retention ratios are 9 to 10, 114.9; 10 to 11, 86.8; 11 to 12, 86.6.

Table C-10a: Projected Ninth Grade Applicant Pool for Oliver Wolcott Regional Vocational-Technical School, 1974-81

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>Torrington</u>								
Public	369	393	379	391	437	402	375	446
Nonpublic	172	145	132	131	123	92	92	81
<u>Barkhamsted</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Canaan</u>								
Public	17	17	14	24	16	19	21	17
Nonpublic	0	0	0	0	0	0	0	0
<u>Colebrook</u>								
Public	0	0	20	13	16	22	17	18
Nonpublic	0	0	0	0	0	0	0	0
<u>Cornwall</u>								
Public	28	20	25	24	17	14	15	15
Nonpublic	0	0	0	0	0	0	0	0
<u>Goshen</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Hartland</u>								
Public	27	38	25	29	38	39	24	24
Nonpublic	0	0	0	0	0	0	0	0
<u>Kent</u>								
Public	44	52	39	44	36	32	27	33
Nonpublic	0	0	0	0	0	0	0	0
<u>New Hartford</u>								
Public	0	0	99	103	98	99	107	83
Nonpublic	0	0	0	0	0	0	0	0
<u>Norfolk</u>								
Public	0	0	41	37	43	33	45	28
Nonpublic	7	11	8	8	8	8	7	10
<u>North Canaan</u>								
Public	52	61	53	52	62	56	49	33
Nonpublic	0	0	0	0	0	0	0	0
<u>Salisbury</u>								
Public	44	65	48	67	58	44	51	29
Nonpublic	32	26	21	16	9	8	8	9
<u>Sharon</u>								
Public	38	40	34	37	36	29	26	15
Nonpublic	0	0	0	0	0	0	0	0
<u>Warren</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Winchester</u>								
Public	416	402	145	163	181	169	174	156
Nonpublic	28	32	31	36	32	33	21	27
<u>Burlington**</u>								
Public	204	163	178	214	105	110	102	99
Nonpublic	0	0	0	0	0	0	0	0
<u>Bethlehem**</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0

Table C-10a (continued):

Current Grade (1973) Entering Grade 9 in	8 <u>1974</u>	7 <u>1975</u>	6 <u>1976</u>	5 <u>1977</u>	4 <u>1978</u>	3 <u>1979</u>	2 <u>1980</u>	1 <u>1981</u>
<u>Morris **</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Washington**</u>								
Public	111	106	91	100	51	56	48	36
Nonpublic	38	31	23	22	6	4	4	3
<u>Canton*</u>								
Public	75	75	73	73	73	82	70	67
Nonpublic	0	0	0	0	0	0	0	0
<u>Harwinton **</u>								
Public	0	0	0	0	0	0	0	0
Nonpublic	0	0	0	0	0	0	0	0
<u>Litchfield</u>								
Public	247	255	243	228	119	118	102	94
Nonpublic	9	0	0	0	0	0	0	0
<u>Totals</u>								
Public	1,672	1,687	1,507	1,599	1,386	1,324	1,253	1,193
Nonpublic	286	245	215	213	178	145	132	130

* Feeder Towns credited with 1/2 enrollment.

** Feeder Towns credited with 1/2 enrollment in 1978.

Table C-10b: Projected Qualified Applicants* to Oliver Wolcott Regional Vocational-Technical School, 1974-81

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Public Applicants</u>								
Series I	252	255	228	241	209	200	189	180
Series II	268	287	271	304	277	278	276	274
<u>Nonpublic Applicants</u>	29	24	21	21	18	14	13	13
<u>Total Applicants</u>								
Series I	281	279	249	263	227	214	202	193
Series II	296	311	293	325	295	293	289	287
<u>Qualified Applicants</u>								
Series I	279	278	248	261	226	213	201	192
Series II	294	309	291	323	293	291	287	286

* Based on a qualification rate of 99.4 for Oliver Wolcott School in 1973.

General Conclusions on Location of a Regional Vocational-Technical School
in the Area of Bristol-Plymouth-Thomaston

The general conclusions of the separate URIC and State Department of Education studies are in agreement, namely that the results suggest that a new regional vocational-technical school in the area of Bristol-Plymouth-Thomaston could achieve desired enrollment levels but would have a serious impact upon Oliver Wolcott Regional Vocational-Technical School in Torrington. The impact upon the W. F. Kaynor school in Waterbury and the E. C. Goodwin school in New Britain would not be significant. However, since the projections suggest a serious impact upon Oliver Wolcott Regional Vocational-Technical School, it is concluded that location of a new regional vocational-technical school in the area of Bristol-Plymouth-Thomaston should not be considered at this time.

PART III - ILLUSTRATIVE CASE STUDIES (continued)

D. Proposed Location in the Area of Branford-East Haven-North Branford-Guilford

This fourth case study was not the subject of a feasibility study under the old enrollment projection methodology, hence there is no other study for comparison. However, "A Study to Determine the Feasibility of an East Shore Career Education Center," prepared by the Connecticut State Department of Education and Connecticut State Advisory Council on Vocational Education was reported in January 1974 and should be used for reference. This case study utilizes current enrollment data and defines feeder towns as indicated in the following tables.

Table D-1: Public School Source of Enrollment for a Proposed Branford-East Haven-North Branford-Guilford Area Regional Vocational-Technical School

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Branford	346	360	312	263
East Haven	491	400	418	416
North Branford	259	252	232	240
Guilford	315	313	281	267
North Haven *	217	214	187	193
Wallingford*	345	336	279	335
Madison	271	228	232	254
Totals	<u>2,244</u>	<u>2,103</u>	<u>1,941</u>	<u>1,968</u>

* Feeder Towns credited with 1/2 of potential enrollment.

Table D-2: Estimated Male and Female Enrollments in Public Schools for Branford-East Haven-North Branford-Guilford Area

Entering Grade 9 in	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	2,244	2,103	1,941	1,968
Male Enrollment	1,142	1,075	991	1,003
Female Enrollment	1,102	1,028	950	965

Note: Estimated percent male in 4th grade is 50.91; in 3rd grade is 51.13; in 2nd grade is 51.08; and in 1st grade is 50.96.

Table D-3: Estimated Applicants to Ninth Grade by Sex from Public Schools to a Branford-East Haven-North Branford-Guilford Regional Vocational-Technical School

<u>Year</u>	<u>Series I*</u>			<u>Series II**</u>		
	<u>Boys</u>	<u>Girls</u>	<u>Total</u>	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
1978	318	22	340	364	65	429
1979	298	20	318	355	72	427
1980	276	19	295	336	75	411
1981	278	19	297	351	88	439

* Series I assumes 27.75 percent for boys and 2.00 percent for girls each year.

** Series II assumes an annual one percent increase for boys and girls beginning in 1973.

Table D-4: Nonpublic School Source of Enrollment for a Proposed Branford-East Haven-North Branford-Guilford Area Regional Vocational-Technical School

<u>Entering Grade 9 in</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Present Grade Enrollment	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Branford	48	46	39	46
East Haven	0	0	0	0
North Branford	0	0	0	0
Guilford	0	0	0	0
North Haven*	0	0	0	0
Wallingford*	16	0	0	0
Madison	43	45	41	35
Totals	<u>107</u>	<u>91</u>	<u>80</u>	<u>81</u>

* Feeder Towns credited with 1/2 of potential enrollment.

Table D-5: Estimated Applicants to Ninth Grade from Nonpublic Schools to a Branford-East Haven-North Branford-Guilford Regional Vocational-Technical School

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Totals	11	9	8	8

Table D-6: Total Estimated Qualified Applicants to Ninth Grade to a Branford-East Haven-North Branford-Guilford Regional Vocational-Technical School

	Total Applicants		Qualified Applicants *	
	Series I	Series II	Series I	Series II
1978	351	440	303	380
1979	327	436	282	377
1980	303	419	262	362
1981	305	447	263	386

* Qualified rate of 86.3 percent for entire system in 1973.

Table D-7: Projected Qualified Applicants to a Branford-East Haven-North Branford-Guilford Regional Vocational-Technical School

<u>Year</u>	<u>Grade</u>				<u>Total</u>	<u>School</u>	<u>Percent</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>Projected</u> <u>Maximum</u> <u>Enrollment</u>		
Series I							
1978	303	0	0	0	303	500	60.6
1979	282	318	0	0	600	500	120.0
1980	262	296	290	0	848	500	169.6
1981	263	274	270	258	1,065	500	213.0
Series II							
1978	380	0	0	0	380	500	76.0
1979	377	398	0	0	775	500	155.0
1980	362	395	363	0	1,120	500	224.0
1981	386	379	360	323	1,448	500	289.6

Note: Grade retention ratios are 9th to 10th, 104.9; 10th to 11th, 91.2; 11th to 12th, 88.9.

Findings for Branford-East Haven-North Branford-Guilford Area Regional Vocational-Technical School

Based on data in Table D-7 a regional vocational-technical school located in this area could be expected to attain an enrollment of over 500 by 1979 in both projection Series. Series I projects a slow decline in the number of qualified applicants to the ninth grade by 1981, but enrollment levels could be maintained by accepting a larger proportion of the qualified applicants.

Projected Impact Upon Eli Whitney Regional Vocational-Technical School

Based upon past data for the number of qualified applicants to the Eli Whitney school (657 in 1973; 721 in 1972; 640 in 1971; 400 in 1970), Series I projects 583 qualified applicants in 1974 and Series II projects 614, as shown in Table D-8. Series I suggests capacity might be exceeded at Eli Whitney by 1974 and increase each year until 1978 when the proposed new school opens. From 1978 to 1981 the total projected maximum enrollment would decline each year but still exceed capacity by 82.6 percent in 1981. It is therefore concluded that Eli Whitney could maintain desired enrollment levels by accepting more qualified applicants even after the new school opens in 1978.

Table D-8: Affect of a Branford-East Haven-North Branford-Guilford Regional Vocational-Technical School Upon Projected Qualified Applicants to Eli Whitney Regional Vocational-Technical School*

	<u>Grade</u>				<u>Total Projected Maximum Enrollment</u>	<u>Capacity</u>	<u>Percent of Capacity</u>
	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>			
<u>Present Enrollment (Oct. 1, 1973)</u>	195	197	174	156	722	912	79.2
Series I							
1974	583	189	171	161	1,104	912	121.1
1975	587	566	165	158	1,476	1,062	139.0
1976	561	569	492	152	1,774	1,062	167.0
1977	580	544	495	454	2,073	1,062	195.2
1978	546	563	473	457	2,039	1,062	192.0
1979	529	530	490	437	1,986	1,062	187.0
1980	515	513	461	452	1,941	1,062	182.8
1981	566	500	447	426	1,939	1,062	182.6
Series II							
1974	614	189	171	161	1,135	912	124.5
1975	651	595	165	158	1,569	1,062	147.7
1976	658	632	518	152	1,960	1,062	184.6
1977	717	638	550	478	2,383	1,062	224.4
1978	707	695	555	507	2,464	1,062	232.0
1979	724	686	605	513	2,528	1,062	238.0
1980	738	703	597	558	2,596	1,062	244.4
1981	848	716	611	551	2,726	1,062	256.7

* See Tables D-8a and 8b for derivation of these data. Grade retention ratios are 9 to 10, 97.0; 10 to 11, 87.0; and 11 to 12, 92.3.

Table D-8a: Projected Ninth Grade Applicant Pool for Eli Whitney Regional Vocational-Technical School, 1974-81

Current Grade (1973) Entering Grade 9 in	8 1974	7 1975	6 1976	5 1977	4 1978	3 1979	2 1980	1 1981
<u>Hamden</u>								
Public	768	720	698	698	698	698	698	698
Nonpublic	209	238	117	110	95	86	69	55
<u>New Haven</u>								
Public	1,294	1,351	1,496	1,611	1,681	1,730	1,753	2,017
Nonpublic	495	486	414	219	414	216	217	220
<u>Woodbridge*</u>								
Public	314	300	86	84	77	73	56	54
Nonpublic	0	0	3	5	3	3	3	4
<u>Bethany</u>								
Public	0	0	101	90	78	88	87	91
Nonpublic	0	0	0	0	0	0	0	0
<u>Prospect*</u>								
Public	125	116	121	114	119	126	119	105
Nonpublic	0	0	0	0	0	0	0	0
<u>Cheshire*</u>								
Public	178	203	213	197	221	198	196	239
Nonpublic	35	31	23	0	0	1	5	6
<u>Wallingford*</u>								
Public	349	357	335	364	345	336	279	335
Nonpublic	23	23	19	21	16	0	0	0
<u>North Haven**</u>								
Public	509	504	455	495	217	214	187	193
Nonpublic	0	0	0	0	0	0	0	0
<u>Totals</u>								
Public	3,537	3,551	3,505	3,653	3,436	3,463	3,375	3,732
Nonpublic	762	778	576	555	528	306	294	285

* Feeder Towns credited with 1/2 enrollment.

** Feeder Towns credited with 1/2 enrollment in 1978.

Table D-8b: Projected Qualified Applicants* to Eli Whitney Regional Vocational-Technical School, 1974-81

	1974	1975	1976	1977	1978	1979	1980	1981
<u>Public Applicants</u>								
Series I	534	536	529	552	519	523	510	564
Series II	566	604	631	694	687	727	742	858
<u>Nonpublic Applicants</u>	76	78	58	55	53	31	29	28
<u>Total Applicants</u>								
Series I	610	614	587	607	572	554	539	592
Series II	642	681	688	750	740	758	772	887
<u>Qualified Applicants</u>								
Series I	583	587	561	580	546	529	515	566
Series II	614	651	658	717	707	724	738	848

* Based upon a qualified rate of 95.6 percent for Eli Whitney School in 1973.

General Conclusions on Location of a Regional Vocational-Technical School in
the Area of Branford-East Haven-North Branford-Guilford

The general conclusion of this research study projection is that a new regional vocational-technical school located in the Branford-East Haven-North Branford-Guilford area could be expected to achieve required enrollments and that it would not have a serious impact upon the Eli Whitney Regional Vocational-Technical School in Hamden.

PART IV - GENERAL IMPLICATIONS OF NEW ENROLLMENT PROJECTION METHODOLOGY

Factors Affecting Projection Accuracy

In considering the enrollment projection methodology prepared as a programmed package within this research study, two factors must be kept clearly separated: a) the structure of the programmed projection methodology itself, and b) the specific parameters estimated for use in the program. It is the general structure of the programmed methodology that represents the major improvement over the present projection system in that enrollments in both public and nonpublic school systems are considered; that separate application rates from public schools by sex are considered; that the number of applicants are reduced by rates of qualification; that grade-specific retention ratios are utilized; and that two different projection series may be obtained. This structure of the projection methodology is not subject to alteration in the program. However, the methodology has been programmed in a generalized manner which allows specific parameters to be altered by the user as new information becomes available so that the projected results might be more accurate. It should be noted that unless the methodology user specifies alternative values for these parameters (as described in the Technical Manual), the program will automatically utilize the estimated values which are discussed in the preceding sections.

Location Town Selection

Prior to the identification of potential feeder towns to a proposed location for a regional vocational-technical school, the town of location for such a new school must, of course, be selected. In some of the recent feasibility studies possible locations have involved only one town (such as West Haven or East Hampton) but in other feasibility studies possible locations have involved a group of towns (such as Bristol - Plymouth - Thomaston). The projection methodology proposed here will yield more

meaningful results if only one town is examined at a time for feasibility as a potential location for a new regional vocational-technical school. Dealing with groups of towns creates conceptual difficulties with the validity of feeder towns identification and with the estimated rates of public and nonpublic applications. However, if groups of towns must be examined, it may be accomplished in one of three ways.

First, the enrollment in public and nonpublic schools may be added together for all towns in the group and entered into the projection program as if it were the enrollment data for a single geographic area. This option, in effect, treats the group of towns as one large town with large enrollment figures and would define feeder towns in terms of those surrounding towns to the entire area. The enrollment data addition must be done by the user prior to entering the projection program.

A second option for dealing with groups of towns is to define the most central town in the group as the most likely location for the proposed regional vocational-technical school and then proceed with the standard projection methodology, except to specify a wider range of feeder towns, i.e., feeder towns to those towns in the entire group.

A third option is to examine each town in the group separately, i.e. to perform a series of individual town feasibility studies for the entire group. This option would present no unique problems for the projection methodology nor would it require data manipulation before input to the program (as does the first option), but it would, unlike the previous two options, provide some comparative information to aid in the selection of the optimal location within the group of towns being considered. For these reasons it is recommended that whenever possible single towns be utilized for the projection methodology.

Identification of Feeder Towns

Identification of feeder towns to the proposed town location for the

new regional vocational-technical school and for existing regional vocational-technical schools is the first and perhaps most crucial step. It heavily influences the conclusions drawn from the results of the projections and impact analyses. If towns are included as feeder towns when, in fact, they will not supply student applicants to the proposed school, the future pool of potential students will be overestimated. This could lead to the erroneous conclusion that the proposed school would be able to achieve operating capacity. Furthermore, during the impact analyses on existing regional vocational-technical schools, if the number of feeder towns is too large, the projected impact of the new school opening upon the number of qualified applicants would be underestimated because the pool of potential students was too large. In short, the identification of feeder towns to the proposed school town location and to existing regional vocational-technical schools must be done very carefully to assure that the projection methodology will yield realistic results.

In view of lack of data on the number of students applying to regional vocational-technical schools by town of residence, it is recommended that the number of feeder towns be conservatively defined, perhaps along the lines of the definition used in this report. Underestimation of the number of qualified applicants is far less serious than is overestimation.

The solution of this problem of feeder town identification is to record data on the number of applicants by town of residence for each existing regional vocational-technical school. With this information the actual number of feeder towns to the present state-wide system could be determined and used as the guideline to identify future feeder towns to selected town locations of proposed new schools. It would also enable a more accurate impact analyses to be performed. It is therefore recommended that these data be compiled and analyzed for the state-wide regional vocational-technical school system over a period of years to the present.

Source School Enrollment Data

Reliability of the projected number of qualified applicants would be increased if the separate numbers of boys and girls enrolled in grades one through nine did not have to be estimated. It is recommended that the number of students enrolled in the public school system be determined for each town in the state by sex and that such data be compiled from at least 1968 to 1973. Once enrollment patterns by sex have been identified, these data should be incorporated into the enrollment projection methodology contained here so that the estimation procedure can be eliminated.

In regard to public school data, it is of basic importance to record the number of applicants to regional vocational-technical schools by sex from the public school systems in feeder towns and the town containing the regional vocational-technical school. Such information would yield the correct rates of application from boys and girls in public schools. If these rates could be determined, the estimation procedure utilized in the projection methodology could be eliminated and the correct application parameters substituted.

The same general considerations are recommended with regard to enrollment in the nonpublic schools, except that data by sex does not appear to be a crucial factor. The total number of applicants from nonpublic schools from feeder towns and from towns containing the regional vocational-technical school should be recorded for each school in the state. This information would enable more correct application rates from nonpublic students to be incorporated into the projection methodology.

In the projection program discussed here, it is assumed by the program that enrollment data for public and nonpublic school systems are correct. The user must make certain that enrollment data read into the program has been corrected for any special error, such as allocation of ungraded elementary students. Such determination of the actual pool of potential

applicants must be accomplished by the user prior to entering the data into the projection program.

Qualified Rates and Retention Ratios

The total number of projected applicants to the ninth grade in the proposed school are reduced by an estimated proportion who will not be qualified, based upon past state-wide trends. It was noted previously that rates of qualification vary a great deal from school to school, and for each school from year to year. Due to this variability, the most recent qualified rates (1973) were used to estimate future rates of qualified applicants. It is recommended that standards for qualification into the regional vocational-technical school system be clearly defined so that there will be greater comparability and stability in these data.

Grade-specific retention ratios for each school in 1973 were used during the estimated impact analysis section of the methodology. These ratios exhibited variability similar to that found for rates of qualification. It is recommended that close attention be given to school-specific grade retention ratios, and that more current values be substituted into the projections whenever possible. In fact, the same is recommended for rates of qualification, i.e., that more current values be utilized for the projection program whenever possible. The programmed methodology has the flexibility of accepting changes in these parameters in terms of changes in input cards described in the Technical Manual. Changing these values may, of course, alter the overall conclusions drawn from the projection technique.

Applicants to Regional Vocational-Technical Schools

It is an assumption of this enrollment projection methodology that data on past trends of applicants to regional vocational-technical schools

reflect actual trends and not simply statistical artifacts created by changes in record keeping procedures. To the extent that data on past applicants may be false, the projection methodology will yield unreliable and invalid projections. To guard against this possibility it is recommended that the concept of an "applicant" be clearly defined for all regional vocational-technical schools and that a uniform system of record keeping be established for the state-wide system. Such data, tabulated by sex, public and nonpublic schools, and for feeder towns and home site, would greatly increase the correctness of the projected qualified applicants.

Projection Alternative

The program also makes two separate projections, Series I and Series II. Series I assumes unchanging rates of application from the public school system and Series II assumes gradually changing rates. Again, the computer program was written so that any set of assumptions regarding application rates may be entered as the parameter to be used and not just the values estimated here. In other words, the user may specify Series II to reflect an annual decline in application rates by sex from public schools or an annual increase of some specific value (the maximum value is ± 9.9 percent change each year). It is recommended that Series I and Series II projection parameters be altered by the methodology user to reflect the judgment of school officials as to "pessimistic" and "optimistic" views of trends in future applicants to regional vocational-technical schools. By changing these parameters future school locations may be given "the benefit of the doubt" under Series II projections rather than attempt to do this indirectly by including as feeder towns a number of places unlikely to send applicants to the new school.

Interpretation of Projections

This new methodology projects the number of qualified applicants to

the ninth grade in the new school five years after the date of the study. These applicants are theoretically entered into the school and carried forward by grade-specific retention ratios. The total theoretical maximum enrollment each year (from 1978 to 1981) is expressed as a percentage of the school's capacity. The computer program also allows the user to specify changes over time in the school's capacity. On the basis of these data a decision must be made whether or not the proposed school location is justified. If both Series I and Series II projections indicate that capacity would not be achieved by 1981, the conclusion would be not to plan to establish the new school in the proposed town at this time. It is recommended that this also be the conclusion in those cases where both Series I and Series II indicate maximum enrollment to be about 115 percent of capacity. This is recommended because some of the qualified applicants who are accepted will fail to report to class (about 10 percent in 1973) and some of the qualified applicants will have applied to more than one school (estimated to be about 4 percent in 1973). This negative conclusion based on the rule of thumb that 115 percent does not justify establishment of a new school in the proposed site is also supported by the knowledge that there are probably several alternative locations in which the number of qualified applicants would greatly exceed the school's capacity, i.e., locations in which there is greater need for a new school. Thus, it is recommended that the projected maximum enrollment be well in excess of the school's capacity before a positive decision is made.

In cases where Series I and Series II projections suggest alternative, conflicting conclusions it is recommended that the more conservative projection, usually Series I, be given the most weight in the decision process. This is because underprojection of demand for a new regional vocational-technical school is not as serious as overprojection.

Impact Analyses

Several existing schools may be affected by the establishment of a new school, hence separate impact analyses are required. The impact analyses follow a similar enrollment projection methodology. If an existing vocational-technical school does not accept a substantial proportion of its qualified applicants, then it is likely that a new school opening would not cause a decline in enrollments. There would be a decline in the number of qualified applicants to the existing school but unless this decline is too great, the existing school could maintain enrollment levels by accepting a larger proportion of its qualified applicants. The key issue is the magnitude of decline in qualified applicants after the new school opens. Again, the recommended rule of thumb is that the projected maximum enrollment should not fall below 115 percent of the school's capacity. If it does, it is recommended that it can be concluded that the new school would have serious impact upon existing vocational-technical schools.

In the case where Series I and Series II projections suggest different conclusions concerning impact of a new school or an existing school; it is recommended that most conservative projection of qualified applicants (usually Series I) to the existing school be given the most weight in the decision process. If the projection methodology indicates that only one existing regional vocational-technical school would be significantly affected by the new school, it is recommended that the new school not be located in the proposed area and alternative locations be sought.

General Considerations

As a final observation concerning interpretation of the projection methodology, an assessment of the reasonableness of projections may be made by comparing the projected number of qualified applicants in 1974 to the existing school (in the impact analysis) with trends in the

actual number of qualified applicants over the past few years. If the number of reported qualified applicants in 1973 is close to the projected number for 1974, then that projection series may be considered reasonable and most likely to occur. However, if the 1974 projections are much higher than or much lower than the 1973 figure, serious doubt is cast upon the assumptions underlying the projections and a new set of projections with different parameters should be made until closer agreement is achieved between the 1973 and 1974 figures.

There could be a variety of reasons why the 1974 projected number of qualified applicants to the existing regional vocational-technical schools differs greatly from the reported number in 1973. The first and most likely reason, if the projected series is too high, is that there are too many towns included as feeder towns, resulting in the pool of potential applicants from source schools being too large. In this event the program should be rerun with the number of feeder towns reduced by more careful selection. This problem would be avoided if, as suggested previously, the actual feeder towns to existing regional vocational-technical schools were known.

There are, of course, a variety of other reasons why the discrepancy exists. The estimated rates of applications from boys and girls in the public school system might be in serious error for that particular set of feeder towns. Likewise, estimated rates of application from students enrolled in nonpublic schools may be in error. The estimated qualified applicant rate may also be mistaken. The values for all of these parameters may be specified by the user and it is recommended that after the number of feeder towns has been fully justified, the values of these other parameters be altered on the basis of official judgment until the projected number of qualified applicants in 1974 is in closer agreement with the reported number in 1973.

It should also be noted that the computer print-out of results of the

projection methodology are in the form of Tables described in the preceding sections of this report. These Tables do not contain all footnotes or references which might be required for clarity. Thus it is recommended that the computer print-out be used as the basic data source for the final report copy, but the report should include required references, footnotes and related information.

Unresolved Issues

In addition to the problems of estimation discussed above, there are several other factors known to influence the number of qualified applicants to the regional vocational-technical school system that could not be included in the projection methodology. The major one is the differential rates of application to an existing school from the feeder towns and the town containing the school. This projection methodology assumes the same application rate for boys and girls in public schools in feeder towns as for students located in the town containing the regional vocational-technical school. It is likely that application rates are highest for students in the town containing the school and differentially lower for students living in feeder towns. The present methodology may, therefore, tend to underestimate the number of applicants from the town containing the school and overestimate the applicants from feeder towns. If the student pools in the town with the school and all other feeder towns are approximately the same, these estimation errors will tend to offset each other, but if the two pools are significantly different, the projections may be too high or too low. It is recommended, therefore, that if further improvements in the projection methodology are considered, data be obtained on application rates from each town so that the data on applications from feeder towns may be treated separately from towns containing a regional vocational-technical school.

Another improvement which might be considered, at least for selected

areas in Connecticut, is to include ethnic groups as a special category of applicants. Through this alteration allowances could be made for areas containing large numbers of blacks, Puerto Ricans, etc. Also, the new projection methodology could be improved by including a provision to project enrollments in special education classes, i.e., nursing, etc.

There are a series of additional factors influencing the accuracy of any projection methodology which, in all likelihood, cannot be systematically considered. These include the effects of labor market demand and curricula changes on the numbers of applicants, the alterations in student transportation policies from feeder towns, the degree of cooperation from high school counselors in suggesting state vocational-technical schools to eighth graders, the attitudes of parents toward this type of vocational-technical career training for their children, the amount of money allocated by the state government for future support and expansion of the entire system, the cost of alternative educational choices open to the majority of students, the future economic conditions in Connecticut and the nation as a whole, and the general public demand for the type of training vocational-technical educational school offers. It is also of importance to remember that this projection methodology does not extend beyond 1981 (or eight years beyond the year of the study) and the conditions affecting applicants to regional vocational-technical schools described above may change during this period or after the eight-year period. This may result in actual conditions in 1981 being significantly different from what was assumed in 1973. In an attempt to consider these possible changes, it is recommended that any potential location for a new regional vocational-technical school be described in close working cooperation with relevant state and local governmental officials and the local school administrators who might be affected. For these and other reasons any projection methodology should be viewed with caution since it cannot predict future conditions but only logical patterns based on a series of assumptions.

PART V - CONCLUSIONS AND RECOMMENDATIONS

This report, together with its accompanying Technical Manual (URIC Report No. 74-54A) and sets of punched data cards, presents and demonstrates new and more accurate means by which the State Department of Education can assess feasibility of locating new regional vocational-technical schools in selected Connecticut towns. It is similar to but improvement over the present feasibility assessment methodology because it is based upon more actual data, it includes important enrollment factors not heretofore considered, and it can produce results very quickly. The separate conclusions and recommendations related to this new enrollment projection methodology and its implementation in four case studies are delineated within the prior text and need not be repeated again. There are, however, other important conclusions and recommendations based upon this research study to be considered.

The first conclusion is appropriate to any new tool - it is relatively valueless unless it is used. Hence, it must be recommended that the State Department of Education initiate implementation of this new computer program as soon as possible and proceed with its implementation until appropriate personnel are familiar with its use and confident in the results it produces.

The second conclusion is that this new enrollment projection methodology is not absolute or perfect. The computer program is designed for maximum user flexibility that will permit changes and improvements to be made as new data are available. But, as designed, this methodology assesses feasibility on the basis of a new regional vocational-technical school achieving planned enrollment capacity for the basic grades 9 through 12 without adverse impact upon these enrollments in nearby existing regional vocational-technical schools. If all of the separate data gathering and analyses recommendations

related to the new methodology are achieved so that its inputs are totally technically sound, the new methodology is still limited in that several important nondemographic factors are not considered. These include the enrollments in other than the standard ninth through twelfth grade curricula and alternative location of special course offerings, as well as changing labor market demands and changing societal trends, which can affect total enrollments and feasibility of a new regional vocational-technical school. However, the new computerized methodology is recommended as a tool by which the weight of these factors and other factors can be assessed in determining feasibility of new regional vocational-technical schools.

A third conclusion is that this new enrollment projection methodology is not now designed to identify "optimum" new regional vocational-technical school locations. It can be so used, but this use would be more costly in time and effort than redesign of the computer program for this purpose. It is recommended that this redesign be considered after the State Department of Education has become familiar and confident with implementation of the present basic program.

Fourth, based on the concept of feeder towns (as indicated in Table I) there are certain sections in Connecticut with towns lying outside of easy access to the current regional vocational-technical school system. These areas are indicated below and it is recommended that priority be given to feasibility studies involving such areas.

Western Connecticut - Possible town locations in the area of Washington, Roxbury, or Woodbury. A regional vocational-technical school located there might serve students from Sharon, Cornwall, Kent, Warren, New Milford, Bridgewater, Southbury, Newtown, Monroe, and Oxford - all towns which are currently without close access to a regional vocational-technical school.

South-Eastern Coastline - A possible school located in the area of Stonington. Such a location might serve the towns of Groton, New London, Ledyard, Preston, and North Stonington - some towns of which are feeder towns to an existing regional vocational-technical school. The planned new school in Groton, to open in 1978, should fulfill this need.

South-Central Coastline - Possible locations in Guilford or Madison area: a school here might serve the towns of Branford, East Haven, North Haven, North Branford, Wallingford, Durham, Haddam, Killingworth, and Clinton - some towns of which are feeder towns to an existing regional vocational-technical school.

Central Connecticut - A possible school located in the area of Hebron-Marlborough. This might serve the towns of Andover, Columbia, Lebanon, Colchester, East Haddam, East Hampton, Portland, and Glastonbury - some towns of which are feeder towns to an existing regional vocational-technical school.

While the possible school locations suggested above appear to be logical choices, it is again recommended that within a longer range program systematic investigation be accomplished in which towns are individually assessed and ranked in terms of their potential for location of new regional vocational-technical schools. From such a ranking of towns, the optimal location for new schools could be determined. As indicated previously, such a state-wide evaluation project lies beyond the purposes of the development of a projection methodology as presented here, but it is recommended that consideration be given to the development of such a more sophisticated computerized evaluation procedure.

Next, while the computer program for this new enrollment projection methodology represents a new tool which can assist in assessment of the weight of nondemographic factors which affect enrollments to the regional vocational-technical school system, it is also a tool by which reassessment

of existing regional vocational-technical school capacities can be made, particularly including the concept of "satellites" such as the Simsbury facilities associated with the A. I. Prince School in Hartford, and additionally leading to identification of need for new schools in more densely populated areas where the capacities of existing regional vocational-technical schools are inadequate and cannot be expanded. The planned new school in Enfield is an example; a new regional vocational-technical school in Norwalk may be another. Hence, it is recommended that this new tool be implemented to reassess enrollment potential to the existing regional vocational-technical schools and the results be used to establish criteria and priorities for future expansion needs of the school system.

Finally, this research study was conducted for a single purpose, namely, to provide a tool for better assessment of feasibility of new regional vocational-technical schools in Connecticut based upon demographic data. It did not consider specialized education needs, or labor market demands, or a multitude of other factors which can affect the future of the regional vocational-technical school system per se, and vis-a-vis vocational career training. Hence, it must be concluded that the Connecticut Regional Vocational-Technical School system should be the subject of a comprehensive planning research study in the near future which will include thorough consideration of economic, educational, and other aspects relevant to vocational-education planning as well as the demographic aspects.